

MODERN STUDIES IN PHILOSOPHY

---

# LEIBNIZ

A Collection of Critical Essays

EDITED BY HARRY G. FRANKFURT

UNIVERSITY OF NOTRE DAME PRESS  
NOTRE DAME LONDON

**Riverside Community College  
Library  
4800 Magnolia Avenue  
Riverside, California 92508**

University of Notre Dame Press edition 1976

Printed by special arrangement with Doubleday & Company, Inc.

Anchor Books edition: 1972  
Doubleday & Company, Inc.  
Garden City, N.Y.

Copyright © 1972 by Harry G. Frankfurt

Manufactured in the United States of America

#### Library of Congress Cataloging in Publication Data

Frankfurt, Harry G. 1929- comp.

Leibniz: a collection of critical essays.

Reprint of the 1st ed. published by Anchor Books, Garden City, N.Y.,  
in series: Modern studies in philosophy.

Bibliography: p.

CONTENTS: Broad, C.D. Leibniz's predicate-in-notion principle and  
some of its alleged consequences.—Couturat, L. On Leibniz's metaphysics.—  
Friedrich, C.J. Philosophical reflections of Leibniz on law, politics, and the  
state. [etc.]

1. Leibniz, Gottfried Wilhelm, Freiherr von, 1646–1716—Addresses, essays,  
lectures.

[B2598.F67 1976]

193

76-41843

ISBN 0-268-01258-X

ISBN 0-268-01259-8 pbk.

## PREFACE

This anthology brings together both new writing on Leibniz and older work that might otherwise escape the student's notice or that he might have difficulty finding. I have not included excerpts from any books devoted primarily to Leibniz, although it has meant omitting some excellent material. Such books will readily come to the attention of anyone who looks up Leibniz's name in the card catalogue of a good library.

Five of the fourteen essays collected here—those by E. M. Curley, Ian Hacking, Jaakko Hintikka, Hidé Ishiguro, and Martha Kneale—were written especially for this volume, although Hintikka's piece has already been published in *Ajatus*, vol. XXI (1969). A sixth essay, by Louis Couturat, has never before appeared in English.

I am grateful to E. M. Curley, Maurice Mandelbaum, Amelie Rorty, and Margaret Wilson for their kindnesses to me in connection with the preparation of this book.

HARRY G. FRANKFURT

## CONTENTS

Preface	v
C. D. BROAD, Leibniz's <i>Predicate-in-Notion Principle</i> and Some of its Alleged Consequences	1
LOUIS COUTURAT, On <u>Leibniz's</u> Metaphysics	19
CARL J. FRIEDRICH, Philosophical Reflections of Leibniz on Law, Politics, and the State	47
E. M. CURLEY, The Root of Contingency	69
MONTGOMERY FURTH, Monadology	99
IAN HACKING, Individual Substance	137
JAAKKO HINTIKKA, Leibniz on Plenitude, Relations, and the "Reign of Law"	155
HIDÉ ISHIGURO, Leibniz's Theory of the Ideality of Relations	191
MARTHA KNEALE, Leibniz and Spinoza on Activity	215
ALEXANDRE KOYRÉ, Leibniz and Newton	239
ARTHUR O. LOVEJOY, Plenitude and Sufficient Reason in Leibniz and Spinoza	281
BENSON MATES, Leibniz on Possible Worlds	335



BERTRAND RUSSELL, Recent Work on the Philosophy of Leibniz	365
MARGARET D. WILSON, On Leibniz's Explication of "Necessary Truth"	401
Bibliography	421

LEIBNIZ

# LEIBNIZ'S *Predicate-in-Notion Principle* AND SOME OF ITS ALLEGED CONSEQUENCES

C. D. BROAD

HISTORICAL. What I call the Predicate-in-Notion Principle was, as far as I know, first explicitly formulated and recognized by Leibniz as a basic principle in his philosophy in the *Discourse on Metaphysics*, which he wrote towards the end of 1685. It was further elucidated and defended in the *Correspondence with Arnauld*, which was occasioned by Leibniz submitting a synopsis of the *Discourse* for Arnauld's inspection and criticism. Both the *Discourse* and the *Correspondence with Arnauld* remained unpublished until the middle of the XIXth century. My account of the Predicate-in-Notion Principle will be derived from those two closely interrelated sources.

FORMULATIONS OF THE PRINCIPLE. Leibniz formulates the Principle in several slightly different ways. I think it is difficult to be certain as to which is the Principle itself and which of them he would have regarded as immediate inferences from it or obvious applications of it. I think we may take the following as the Principle itself: In every true affirmative proposition, whether it be necessary or contingent, universal or singular, the notion of the predi-

From *Theoria*, vol. XV (1949). Reprinted by permission of the author and the editor of *Theoria*.

cate is contained either explicitly or implicitly in that of the object. If it is contained explicitly the proposition is analytic; if only implicitly, it is synthetic. Leibniz says that this seems to him to be self-evident when he considers what is meant by a proposition being true.

We must notice also, however, the following two assertions which occur in close connection with the one I have just quoted. (i) Every substance has a notion so complete that anyone who fully understood it could infer from it all the predicates, down to the minutest detail, which will ever belong to that substance. I think that Leibniz regarded this as an immediate consequence of applying the Predicate-in-Notion Principle to the special case of true affirmative propositions about *individuals*. We might call this the Principle of *Pre-determinate Individual History*. (ii) For every contingent fact there is a reason why the fact is just so and not otherwise, but such reasons incline without necessitating. This is what Leibniz calls the *Principle of Sufficient Reason*. He says that it is equivalent to the principle that there is a proof *a priori*, even in the case of *contingent* true propositions, which would show that the connection between subject and predicate is founded upon the natures of those terms.

ALLEGED CONSEQUENCES OF THE PRINCIPLE. I will now state Leibniz's opinions about the logical relations of the Principle to certain other propositions. These may be divided into negative and positive. 1. He held, and he argued strongly against Arnauld, that the Principle does *not* entail that all facts are logically necessary, and does *not* exclude free-will. As we know, Leibniz held that there are contingent facts, and he held that human voluntary decisions are in some sense free. 2. In Section 9 of the *Discourse* he explicitly states that the following propositions follow from the Principle. (i) That no two substances are exactly alike in all their predicates. (ii) That a substance cannot begin except by being created, nor cease except by being annihilated by God. (iii) That a substance cannot

be divided into two, and that two or more substances cannot be compounded into one. (iv) That each substance is like a complete world, and mirrors the whole universe from its own point of view. In Section 14 he adds the following further consequences. (v) Each substance is independent of everything else except God, and no created substance acts upon or is acted upon by any other. (vi) If a person were able to cognize distinctly all that is happening in or appearing to him at the present moment, he could foresee all that will happen in him or appear to him forever. He reiterates many of these statements in his letters to Arnauld.

COMMENTS AND CRITICISMS. I hope that I have now said enough to give a rough general idea of what Leibniz meant by the Predicate-in-Notion Principle and what he believed to be its logical relations to certain other important propositions. I shall devote the rest of the lecture to comments and criticisms.

### 1. *The complete notion of a species.*

Leibniz says that it is important to distinguish between the complete notion of a species, e. g., the circle, and the complete notion of an individual, e. g., Adam. We will begin with species. The first example that I will take is the circle. There is an unlimited number of geometrical properties which belong to all circles and to nothing but circles. I think that Leibniz would say that the complete notion of the circle consists of all these properties. Now one and only one of these would commonly be said to be what the word 'circle' means, viz., the property of being a plane curve all of whose points are equidistant from a certain fixed point. I think that Leibniz would call this property 'the essence of the circle' and would say that it constitutes 'the real definition', as opposed to various possible 'nominal definitions' of the word 'circle'.

Now, in the case of the circle, I think that he would

say that all the other properties in the complete notion follow necessarily from the real definition. Consider now any true statement of the form: "The circle has the property P". Here 'P' must stand either for the defining property or for one of the other properties in the complete notion. On the first alternative I think that Leibniz would say that the predicate is *explicitly* contained in the notion of the subject; on the second alternative that it is contained *implicitly*. But, in either case, he would say, the proposition is necessary and independent of God's free decrees, whether actual or possible.

All this looks plausible enough at first sight. But the following comments must be made. (i) Suppose we had taken as our example the *ellipse* instead of the circle. There is an infinitely numerous set of geometrical properties which belong to all ellipses and to nothing but ellipses. But is there any property which can plausibly be said to be what the word 'ellipse' *means*? The property most nearly analogous to the real definition of the circle is the following, viz., that an ellipse is a plane curve such that the sum of the distances from any point on it to a certain pair of fixed points is constant. But it would be fantastic to suggest that this is what is meant by the word 'ellipse'. And the same would be true of any other property which might be proposed as the real definition. Thus the fact is that the ellipse has a complete notion; and that all the rest of the properties in it follow from any one property in it; but none of them can be singled out as the 'essence' or 'real definition'.

This makes one suspect that it is a very contingent fact that there is a real definition in the case of the circle. It seems to depend on the fact that here there is one and only one very simple and striking property which almost 'hits one in the eye'. So the distinction between predicates which are contained explicitly, and those which are contained only implicitly, in the notion of a certain kind of geometrical figure turns out to be mainly relative. It depends upon which of them you take as the defining prop-

erty, and there seems to be no objective ground for taking one rather than another.

(ii) It is not strictly true, even in the case of the circle, to say that the rest of the properties in the complete notion follow necessarily from the defining property. The possession of the other properties follows from the possession of the defining property *together with* the axioms of Euclidean geometry. Leibniz would no doubt have said that the notion of any kind of geometrical figure contains *inter alia* the axioms of Euclid. And he would doubtless have held that these axioms are necessary propositions, holding in all possible worlds and therefore independent of God's free decrees. Suppose we take the same property as defining the circle and combine it in one case with the axioms of Euclid and in the other with those of Lobatchefski. Some of the properties entailed would be the same, but others would be different. Thus, while the real definition of the circle would be the same, the complete notion of the circle would be different. Leibniz would have to talk of different possible kinds of circle, just as he talks of alternative possible Adams. And he would have to say that the notion of each alternative possible kind of circle contains the notion of certain possible free decrees of God, which fix the geometry of a certain possible world. And similar remarks would apply to any other kind of geometrical figure.

If we want an example of a specific notion in which all the predicates are *necessarily* interconnected, we must leave geometry and go to pure arithmetic. Take, e. g., the notion of a *prime number*. The accepted definition of this is an integer which is not exactly divisible by any other integer except itself and unity. The complete notion of a prime number would consist of all these properties which belong to all such integers and only to such integers. For example, one property which is contained in the notion of a prime number is that the immediate successor of the product of all the integers below it is divisible by it (*Wilson's Theorem*). This property is not contained *explicitly*

in the notion of prime number, i. e., it is not identical with or a conjunct in its defining property. But it is contained *implicitly*, in so far as it follows from the defining property together with premises which are all propositions of logic or pure arithmetic and are necessary and independent of God's volitions.

I think that these examples probably illustrate what Leibniz had in mind in the distinction which he draws in the *Letters to Arnauld* between *absolutely* and *conditionally* necessary propositions. Suppose we take a certain property P as the defining property of a certain subject S. Let Q be another property which belongs to S. (i) It might be that S is Q follows from S is P *alone*, as, e. g., *negroes are black* follows from *negroes are black men*. (ii) Failing this it might be that S is Q follows from the combination of S is P with premises all of which are *necessary*. In these two cases Leibniz would say I think that S is Q is *absolutely* necessary. In case (i) he would say that the predicate is *explicitly* contained in the notion of the subject, and in case (ii) that it is contained *implicitly*. (iii) Next suppose that S is Q follows from a combination of S is P with certain general premises which are true in the actual world but are not all necessary. Then I think that Leibniz would call S is Q *hypothetically* necessary.

I shall now leave mathematical examples of species and consider those which Mill calls 'natural kinds'. An example would be the species of matter called 'iron', or the species of animal called 'horse'.

It is a fact about the actual world that there are certain small groups of properties, about which the following propositions are true. (i) Any two things which have all the properties in such a group have also innumerable other properties in common, and differ only in minor respects. (ii) If X has all the properties in such a group and Y lacks any of them, then X and Y will differ in a great many major respects. Take, e. g., the two properties of melting at  $1062^{\circ}$  C and having a density of 19.26 gms per cc. Any two bits of matter which have both these properties



agree also in having the chemical and physical characteristics of gold. Any bit of matter which lacks either of them differs also in many other important properties from any bit of matter which has them both. I call any such small group of properties a 'sufficient description of a natural kind'.

The complete notion of a natural kind will consist of a sufficient description of it, together with all the other properties common and peculiar to all substances which answer to that description. Suppose that the omission or the appreciable modification of any property in a sufficient description of a natural kind would make it *insufficient*. Then we may call it a '*minimal* sufficient description'. The same natural kind may have several minimal sufficient descriptions. For example, 'rational animal' and 'animal with two legs and no feathers' are two such descriptions of the natural kind *man*.

It is only because of these contingent facts about the actual world that it is practicable and useful to have specific names like 'gold', 'man', 'horse', etc. And it is only because of such facts that we can talk of 'definitions' of such names.

Speaking in Leibnizian terms we could say that the notion of a natural kind contains *inter alia* the notion of a free decree of God to associate together a certain set of characteristics in a certain possible world, in the way described. In one of the alternative possible worlds, e. g., the property of being rational would be associated, not with those which are here characteristic of men but with those which are here characteristic of horses.

Now there is *prima facie* the following important difference between a species of geometrical figure and a natural kind. Suppose you take any minimal sufficient description of the circle. Then all the other properties in the complete notion of the circle follow from this together with the axioms of geometry in the world under consideration. Now these axioms are not specially concerned with *circles*; they are extremely general propositions about spa-

tial order and interconnexion. *Prima facie* there is nothing to correspond to this in the connexion between a minimal sufficient description of a natural kind and the rest of the properties in its complete notion. Thus, to speak in Leibnizian terms, the notion of any one natural kind seems to involve a number of very special divine decrees peculiar to it. But the notion of any one species of geometrical figure seems to involve no special divine decrees peculiar to it, but only very general divine decrees about the spatial aspect of a certain possible world.

## 2. *The complete notion of an individual.*

We are now in a better position to consider what can be meant by the 'complete notion' of an *individual*, e. g., of Adam. A very important new feature which enters here is that we must now take account of *singular* propositions, which involve determinate dates and may involve determinate places, e. g., *Queen Elizabeth sneezed at 5 p. m. on Xmas Day 1597.*

The next point is this. The notion of an individual is the notion of something which persists for a time, however short, and which is in a perfectly determinate state at every moment of its history. Whether an individual changes or remains qualitatively unchanged between two given moments, the notion of it includes an infinite number of singular propositions specifying its state at each of the continuous series of intermediate moments. It is therefore plain that Leibniz is right when he says that no human being could have an adequate and distinct idea of the complete notion of any individual, actual or possible.

We may next note the following fact. The various propositions which are true of an individual substance are of two different kinds, viz., *non-dispositional* and *dispositional*. It is a non-dispositional proposition about a certain bit of gold that it is at a certain temperature at a certain moment. It is a dispositional proposition about it

that, if at any time its temperature should be at or above  $1062^{\circ}$  C, it would then be in a liquid state.

The dispositional propositions which are true of an individual are of various orders of generality. Some are equally true of all bits of matter, e. g., the law of inertia. Some are true only of all bits of matter of the kind to which this individual belongs, e. g., that it has such and such a melting-point. We must also admit the possibility that some are *peculiar* to the individual. Thus, e. g., it might well be the case that there are certain psychological dispositional propositions about a person, which are not entailed by the general laws of human psychology together with the non-dispositional facts about that person.

From the fact that there are dispositional propositions about an individual it follows that not all the propositions which are true of an individual are logically independent of each other. For example, the proposition, *This bit of gold was liquid at 12 o'clock today*, follows logically from the propositions, *This bit of gold was at a temperature above  $1062^{\circ}$  C at 12 o'clock today* and *the melting point of gold is  $1062^{\circ}$  C*. We can therefore conceive a sub-class of propositions to be selected, on the following principles, out of the sum total of the propositions which are true of an individual. (i) No proposition in such a sub-class is to be logically entailed by any combination of the other propositions in it. (ii) Every true proposition about the individual, which is not contained in a given sub-set of this kind, is to be entailed by some combination of the propositions which *are* contained in it. I will call any such sub-class a '*nuclear* sub-class' for that individual. There might be many alternative nuclear sub-classes for the same individual.

The next point to note is this. Any nuclear sub-class would suffice to distinguish the individual concerned, not only from every other *actual* individual, but also from every other *possible* individual. And nothing less than a nuclear sub-class would suffice to distinguish it from every other possible individual. This is because a nuclear sub-class en-

tails *all* the other propositions which are true of the individual. A selection of propositions which is non-nuclear may suffice to distinguish an *actual* individual from all other *actual* individuals. It may also suffice to distinguish a *merely possible* individual from all other *possible* individuals which belong to the *same possible world*. Thus, e. g., the property of being a man without human parents suffices to distinguish the actual Adam from all other actual individuals. But the presence of that predicate does not entail that of all the other predicates which belong to the actual Adam. So the class of which this proposition is the only member is not a nuclear sub-class. Again, this proposition does not suffice to distinguish the actual Adam from all other *possible* individuals, since it might be supplemented in innumerable different ways. Speaking in Leibnizian terms, we might say, I think, that every proposition in a nuclear sub-class is the expression of a free decree of God in regard to the universe of which that individual is a member. If the individual actually exists, those free decrees are actual; if he is only a possible individual in an alternative possible world, they are merely possible.

Before summing up about the complete notion of an individual it will be useful to define for the present purpose two terms, viz., 'characteristic' and 'predicate'. Suppose that a certain bit of gold was liquid at several different moments  $t_1$ ,  $t_2$ , etc. Then I shall say that liquidity is a characteristic which this bit of gold had on various occasions; and I shall say that 'being liquid at  $t_1$ ', 'being liquid at  $t_2$ ', etc. are so many different predicates of this bit of gold. We might call the kind of predicate which is expressed by the formula 'having the characteristic  $Q$  at the moment  $t$ ' an '*instantaneous predicate*'. There are also various kinds of temporally generalized predicates, e. g., 'having the characteristic  $Q$  sometimes', 'having the characteristic  $Q$  at all moments between  $t_1$  and  $t_2$ ', and so on. And the characteristic involved in a predicate may be

dispositional, e. g., 'magnetic', 'melting at  $1062^{\circ}$  C', and so on.

I will now summarize the position as follows. I take it that 'the complete notion of an individual' means the collection of every predicate of it which refers to any moment in its history. This collection will always contain predicates of two fundamentally different kinds, viz., non-dispositional and dispositional. The dispositional predicates will be of various orders of generality, and it may be that some of them are peculiar to the individual. Within the complete notion of an individual there will be one or more nuclear sub-classes of predicates. The predicates in a nuclear sub-class suffice to distinguish an individual from all others, *actual or possible*. But an actual individual may be distinguished from all other *actual* individuals, though not from all other *possible* individuals, by a selection of predicates which do not constitute a nuclear sub-class.

### 3. *Is the complete notion of the individual a genuine entity?*

This question reduces to the following: Does the phrase 'every predicate of an individual which refers to any moment in its history' denote a genuine collection, which is, in some intelligible sense, complete at every moment, including the moments (if such there be) before this individual began to exist? Leibniz evidently thought that it does.

I think that the case for an affirmative answer might be put most plausibly as follows. Suppose that it is a fact that Queen Elizabeth sneezed at 5 p. m. on Xmas Day 1597. Then anyone who, at any moment *before* then, had said, 'Queen Elizabeth *will* sneeze at 5 p. m. on Xmas Day 1597', would have been speaking truly. Anyone who had said *at that very moment*, 'Queen Elizabeth *is sneezing* at 5 p. m. on Xmas Day 1597', would have been speaking truly. And anyone who, at any moment *after* then, had

said, 'Queen Elizabeth *did* sneeze at 5 p. m. on Xmas Day 1597', would have been speaking truly.

If we consider these sentences and the beliefs which they correctly express, we find that we can distinguish a *common content* and a *difference of tense*. We can also distinguish between what we might call the '*time of occurrence*' and the '*time of reference*'. The common content refers to an individual (Queen Elizabeth), a characteristic (sneezing), and a date. This date is the date of *reference*. The difference of tense is expressed by the difference between the copulas 'will', 'is now', and 'did'. The date of occurrence is the date at which someone has the belief or utters the sentence which expresses it.

Now it seems plausible to suggest that the common content is a fact about Queen Elizabeth and sneezing and the date of reference; and to say that, although this fact *contains* that date as a constituent, it *has* itself no date of occurrence. Such a fact might be expressed by the formula: 'S is tenselessly characterized by Q at t'. The various beliefs, with their various dates of occurrence, are made true by corresponding to this tenseless fact about an individual, a characteristic, and a date of reference. The differences in tense correspond to differences in the temporal relation between the date of occurrence of the belief and the date of reference, which is a constituent in the tenseless fact to which the belief refers. Thus, e. g., the total fact which corresponds to a true belief, occurring at  $t_1$ , that S *will be* characterized by Q at  $t_2$ , consists of the two following facts, viz., (i) the fact that S is tenselessly characterized by Q at  $t_2$ , and (ii) the fact that  $t_1$  is tenselessly earlier than  $t_2$ .

There are two and only two kinds of change which can happen to a fact of tenseless characterization. One is that the date of reference, which is a constituent in it, alters continuously in respect of the purely temporal property of pastness, presentness, and futurity. It becomes less and less remotely future, then present, and then more and more remotely past. But the fact itself, being dateless,

undergoes no such change. The other kind of change is that, while such a fact cannot be an object of *non-inferential knowledge* to any human being at any date earlier than the date of reference in it, it may become the object of such knowledge from time to time at any date which is not earlier than the date of reference in it.

I suppose that Leibniz may have had some such considerations as these in his mind when he assumed that the phrase 'every predicate of an individual which refers to any moment in its history' denotes a genuine collection which is complete at every moment. It may be noted that this line of thought, for what it may be worth, is quite independent of theological considerations. But Leibniz would no doubt have also argued as follows: God knew at every moment before 5 p. m. on Xmas Day 1597 that Queen Elizabeth would then sneeze. Therefore, he would say, there must always have been this fact or true proposition to be the object of God's acts of knowing at each of these earlier moments.

#### 4. *Does the Principle really have any ontological consequences?*

As we have seen, Leibniz thought that the Predicate-in-Notion Principle has many ontological consequences. It is not easy to believe that important ontological principles could be entailed by such an extremely abstract logical principle alone. One is inclined to suspect that other premises must have been surreptitiously combined with it.

I suspect that the reasoning at the back of Leibniz's mind may be illustrated by the following line of argument. Since it was already true when Queen Elizabeth was first created that she will sneeze at 5 p. m. on Xmas Day 1597, she must have been created with a certain modification corresponding to this fact about her. Since it is true at every moment of her history up to the date of reference in this fact that she *will* then sneeze, this modification must have persisted until then. And, since it is true at

every moment after then that she *did* then sneeze, the same modification must persist in her after then for as long as she continues to exist.

The persistent modification in the substance itself is, so to speak, the *ontological correlate* of the fact of tenseless characterization in the complete notion of the substance. Now all that happens or can happen to the fact of tenseless characterization is that the date of reference, which is a constituent in it, becomes less and less remotely future, then present, and then more and more remotely past. Similarly, all that happens or can happen to the correlated modification of the substance is its emergence from quiescence into activity at a certain moment and its subsequent reversion to quiescence. Corresponding to every non-dispositional fact of tenseless characterization in the notion of a substance there would be a special modification of the substance itself, which persists throughout the whole of its history, explodes into activity at the moment when the date of reference in the fact becomes present, and then reverts for ever to quiescence.

Now this kind of theory or picture is quite familiar in regard to dispositional facts. The conditional fact, 'If a bit of gold were at any time raised in temperature above  $1062^{\circ}$  C it would then melt', is commonly held to correspond to a certain persistent structural peculiarity present in every bit of gold at every moment of its history. Again, the power of remembering a past experience is commonly thought to correspond to a modification, originally produced in the mind or the brain by the experience, which persists indefinitely thereafter. The difference in these cases from the case of a modification which corresponds to an instantaneous predicate, is that here the same modification may burst into activity on many occasions instead of only once.

It seems to me pretty plain that Leibniz thinks of every substance as coming into existence with a stock of innate modifications. These correspond (i) to every non-dispositional fact of tenseless characterization which refers



to any moment in its history, and (ii) to every dispositional fact about it. This seems to be the suppressed premise which has to be combined with the Predicate-in-Notion Principle if one is to derive from it any positive ontological conclusions. It may have been suggested to Leibniz by the Predicate-in-Notion Principle, and he may have seen no other way in which the complete notion of an individual could be embodied in that individual. But I do not think that one can admit that it is logically entailed by the Principle.

Whether, even with this additional premise, one can legitimately deduce the various ontological principles which Leibniz alleges to follow from the Predicate-in-Notion Principle is a question of detail into which I shall not here enter.

### 5. *Is the Principle compatible with contingency?*

In discussing this question it will be best to begin by considering certain typical sentences. We may call the sentence 'The protestant daughter of Henry VIII was a protestant' *explicitly analytic*. The two sentences 'The unmarried daughter of Henry VIII was a protestant' and 'Queen Elizabeth was a protestant' are not explicitly analytic. But this is also true of the sentence 'The sun rises in the east'. If we consider the last sentence more carefully, we can raise the following question: What do we understand by 'east'? Does it mean just 'the quarter in which the sun rises'? If we substitute this *definiens* for the word 'east', the sentence does become explicitly analytic. But suppose we take the word 'east' to be defined by reference to the way in which a suspended magnet sets itself. Then the substitution of the *definiens* does not make the sentence explicitly analytic.

Suppose now that a sentence, which is not explicitly analytic, contains a word or phrase which has a generally accepted definition or description. Suppose that, when this is substituted for the word or phrase, the sentence be-

comes explicitly analytic. Then we may call the original sentence *implicitly analytic*. Thus, if the commonly accepted definition or description of the 'east' is 'the quarter in which the sun rises', the sentence 'The sun rises in the east' is implicitly analytic. If a sentence is neither implicitly nor explicitly analytic, we will call it synthetic.

Now a sentence like 'Queen Elizabeth was a protestant' or 'The unmarried daughter of Henry VIII was a protestant' is certainly not *explicitly* analytic. But it is also not *implicitly* analytic. No doubt it is true that the proper name 'Queen Elizabeth' and the definite description 'The unmarried daughter of Henry VIII', both apply to the same individual as the definite description 'The protestant daughter of Henry VIII'. And no doubt the sentence 'The protestant daughter of Henry VIII was a protestant' is explicitly analytic. But those two facts do not make the sentences 'Queen Elizabeth was a protestant' and 'The unmarried daughter of Henry VIII was a protestant' implicitly analytic. The essential point here is the following. A grammatical proper name, such as 'Queen Elizabeth', has no commonly accepted definition. Therefore the sentence 'Queen Elizabeth was a protestant' cannot be made explicitly analytic by any substitution of *definiens* for *definiendum* in it. Again, no substitution of generally accepted definitions or descriptions for the word 'protestant' and the phrase 'unmarried daughter' will render the sentence 'The unmarried daughter of Henry VIII was a protestant' explicitly analytic. So these two sentences are synthetic. The same is true of any sentence whose grammatical subject is a grammatical proper name, such as 'Queen Elizabeth' or 'Winston Churchill'. And it is true of most sentences in which the grammatical subject is a phrase which uniquely describes an actual individual.

The following fact should, however, be noted here. When a person refers to an historical individual by a grammatical proper name, such as 'Queen Elizabeth', he must have at the back of his mind some sort of description of the individual in question, even if it be only of the form

"The monarch who is referred to in books on English history as Queen Elizabeth"; for it is plain that no grammatical proper name, used of an individual whom one has never met, can possibly function as a pure logical proper name, as, e. g., the word 'that' might do if one pointed to a certain visible object and said 'That is a cow'. So, for the present purpose, the sentence 'Queen Elizabeth was a protestant' is really equivalent to a sentence of the form: 'The person who answered to such and such a description was a protestant'.

Now in general one does not know what description is at the back of another person's mind when he utters or understands such a sentence. Often that person himself would be hard put to it to say exactly what it is. Perhaps the most that can be said is that a certain complex mental disposition, which he has acquired in the course of his reading, is active at the time; and that this checks him and gives him a certain feeling of intellectual discomfort if he uses the name himself or hears it used by others outside a certain limited range of contexts. The description which is attached to such a name will almost certainly vary from person to person, and from one occasion to another in the same person. Now it might happen for a certain person on a certain occasion to include the property of being protestant. He might, e. g., be thinking of Queen Elizabeth as the first protestant Queen of England in her own right. If so, we might say that the sentence would be 'implicitly analytic' in a certain sense *for* that person *on* that occasion, in spite of the fact that the name 'Queen Elizabeth' has no commonly accepted definition or description.

Subject to the above qualifications, we may sum up the matter as follows. If a proposition about a term is to be necessary, the following conditions must be fulfilled. (i) The term must have a commonly accepted definition or description. (ii) The proposition in question must be entailed, either by this definition or description alone, or by this together with premises all of which are necessary. Now

it is plain that these conditions are not fulfilled in the case of most propositions about individuals. The grammatical proper names of individuals do not have definitions, and there is no generally accepted description for any individual. And, even if the first condition were fulfilled, the second would break down as regards most propositions about individuals.

Now the Predicate-in-Notion Principle, as I have understood it, makes the following assertions. (i) That there is, for every individual, a complete collection of facts of the form 'S is tenselessly characterized by Q at t', covering the whole history of that individual. (ii) That each such fact, though it contains a date of reference as a constituent, has itself no date of occurrence, but subsists timelessly. I think it is plain that this does not entail that all or any of such facts are expressible by sentences which are either explicitly or implicitly analytic. It does not entail that an individual has a generally accepted definition or description. And it does not entail that, if an individual had such a definition or description, every true proposition about it would follow either directly from this or from this together with premises each of which is necessary. So it appears to me that, if Leibniz meant what I suggest that he meant, he was right in holding that the Predicate-in-Notion Principle is compatible with there being contingent facts.

# ON LEIBNIZ'S METAPHYSICS

LOUIS COUTURAT

In the preface to *La Logique de Leibniz*, we asserted that Leibniz's metaphysics rests entirely on his logic. This thesis is confirmed implicitly in our book and is evident from the texts we had occasion to cite there. Nevertheless, since it is contrary to the classical interpretations and to current opinion, it will be useful to establish it explicitly and in detail. Moreover, although it appears to us to be sufficiently proven by the texts which are already known, we are now able to confirm it by adducing some unpublished documents of unusual value and importance. The most interesting and most significant is a short work of four pages in which Leibniz himself has given a succinct account of his entire metaphysics in deducing it from the *Principle of Reason*. We cited its essential propositions in our preface and in the course of our book. We [now] want to make the new material available. . . .<sup>1</sup>

Translated for this volume by R. Allison Ryan from "Sur la Métaphysique de Leibniz," which appeared in *Revue de Métaphysique et de Morale*, vol. 10 (1902). Permission to publish this translation has been granted by the Société Française de Philosophie.

<sup>1</sup> [Translator's note: We indicate by asterisks the omission of the Latin text of the manuscript *Primae Veritates*, which Couturat includes in this paper. This manuscript was discovered by Eduard Bodemann among the non-philosophical manuscripts of Leibniz. See Bodemann, *Die Leibniz-Handschriften* (Hanover, 1895), p. 102. The text is catalogued *Phil.* VIII, 6-7 in

\* \* \* \* \*

This fragment is unfortunately not dated. But, by comparing it to short works and letters of known date, we can conjecture with high probability that it was written about 1686 when Leibniz completed the principles and the essential theses of his system, first in the *Discours de métaphysique* and then in his *Lettres à Arnauld*.<sup>2</sup> In fact, the preceding passage does not contain a single proposition which is not already to be found in one of these works. It is none the less original and valuable, however, in virtue of the order and connection which it establishes among all those known propositions.

In the first place, it formulates precisely the famous principle of reason, of which the classical expression *nihil est sine ratione* is, according to Leibniz, only a popular formula borrowed from common sense.<sup>3</sup> In its exact sense, this principle means that in every true proposition the predicate is contained in the subject; therefore, that every truth can be demonstrated *a priori* by the simple analysis of its terms. In a word, that *every truth is analytic*. This may seem paradoxical and even shocking to us who have read Kant. But it seemed entirely natural and evident to Leibniz's contemporaries who, like him, were trained in the Aristotelian and scholastic tradition. And the proof

---

L. Couturat, *Opuscules et fragments inédits de Leibniz* (Paris, 1903); there is an English translation in L. Loemker, *Leibniz: Philosophical Papers and Letters* (Chicago, 1956), p. 411. In the footnotes which follow, *Ger. Phil.* designates C. I. Gerhardt, ed., *Philosophische Schriften von G. W. Leibniz*, 7 vols. (Berlin, 1960-61); *Ger. Math.* designates C. I. Gerhardt, ed., *Mathematische Schriften*, 7 vols. (Berlin and Halle, 1849-55). We have revised Couturat's occasional footnote references to the *Primae Veritates* text.]

<sup>2</sup> Let us say, on this point, that the numerous *dated* texts which we have found show that Leibniz's system was much more precocious than has been thought; it was already preformed in the theories of his early youth. See the texts dated 1676 which we will cite later (Couturat, *Phil.* I, 14, c. 8; VIII, 71).

<sup>3</sup> *Lettre à Arnauld*, 14 July 1686 (*Ger. Phil.* II, 56). *Specimen inventorum* (*Ger. Phil.* VII, 309).

of this is that Arnauld, who was extremely averse to admitting certain consequences of this principle (in particular, the major thesis that "the individual notion of each person contains definitively all that will ever happen to him"), never dreamed of expressing any reservation or doubt about it. On the contrary, he accepted it without qualification and without discussion.<sup>4</sup>

Why is this principle called the "principle of reason" (of *determining* reason at first and, later, of *sufficient* reason)? It is because it means, in brief, that one can *give the reason* for every truth, that is, demonstrate it by analysis. Thus it was originally called "the principle of giving the reason" (*principium reddendae rationis*).<sup>5</sup> This must

<sup>4</sup> *Lettre d'Arnauld*, 28 Sept. 1686: "J'ay sur tout esté frappé de cette raison, que dans toute proposition affirmative véritable, nécessaire ou contingente, universelle ou singulière, la notion de l'attribut est comprise en quelque façon dans celle du sujet: *praedicatum inest subjecto*." [I was especially struck by this reason, that in every true affirmative proposition, necessary or contingent, universal or singular, the notion of the attribute is contained in some fashion in that of the subject: *praedicatum inest subjecto*.] (*Ger. Phil.* II, 64).

<sup>5</sup> "Principium omnis ratiocinationis primarium est, nihil esse aut fieri, quin ratio reddi possit, saltem ab omniscio, cur sit potius quam non sit, aut cur sic potius qual aliter; paucis, *omnium rationem reddi posse*." [The primary principle of every method of reasoning is that nothing is or happens for which it is not possible for the reason to be given, at least from an omniscient point of view, why it is rather than is not or why it is so rather than otherwise; in short, *it is possible for the reason of everything to be given*.] (Couturat, *Phil.* IV, 3, c, 13). "Principium ratiocinandi fundamentale est, *nihil esse sine ratione*, vel . . . nullam esse veritatem, cui ratio non subsit. Ratio autem veritatis consistit in nexu praedicati cum subjecto, seu ut praedicatum subjecto insit . . ." [The fundamental principle of reasoning is that *nothing is without reason*, or that there is no truth for which there is no underlying reason. However, the reason of the truth consists in the connection between the predicate and the subject, whether the predicate is contained in the subject . . .] (Couturat, *Phil.* I, 15). Cf. *De Synthesi et Analysisi universali* (*Ger. Phil.* VII, 296); *Specimen inventorum* (*Ger. Phil.* VII, 309); *Ger. Phil.* VII, 199; Bodemann, p. 115.

not lead one to confuse it with the principle of identity; it is precisely its reciprocal. The principle of identity states: every identity (analytic) proposition is true. The principle of reason affirms, on the contrary: every true proposition is an identity (analytic). Its effect is to subordinate all truths to the principle of identity. One might call it the principle of universal intelligibility, or, if one may venture this barbarism, of universal *demonstrability*.

This is the source of the metaphysical import of the principle, which Leibniz recognized and utilized at an early date.<sup>6</sup> We know how he derived from it the principle of indiscernibles and that other principle, really equivalent to the preceding one, that "there are no purely extrinsic characteristics [*dénominations*]";<sup>7</sup> then, step by step, the notion of the *monad* (though not the name), which includes not only all its past, present, and future states, but

<sup>6</sup> Already in November 1677 he wrote, "Principium illud summum: *nihil esse sine ratione*, plerasque metaphysicae controversias finit." [This principle is of the highest importance: *nihil esse sine ratione*, and it will put an end to many of the controversies of metaphysics.] *Scientia media* (Couturat, *Phil.* IV, 3, c, 15). And, in fact, he used it on November 27, 1677, to demonstrate the existence of God in his *Conversatio cum D. Episcopo Stenonio de libertate* (Bodemann, p. 73).

<sup>7</sup> An unpublished fragment begins with this sentence: "Maxime in tota philosophia ipsaque theologia momenti haec consideratio est, nullas esse denominationes pure extrinsecas . . ." [The following consideration is of the utmost importance in all of contemporary philosophy and theology: there are no purely extrinsic characteristics . . .]; and ends with the following remark: "Omnia quae hac et praecedenti pagina diximus oriuntur ex grandi illo principio, quod praedicatum inest subjecto." [Everything which we have said on this and the preceding pages derives from that important principle, the predicate is contained in the subject.] (Couturat, *Phil.* I, 14, c, 7). Now the content of this fragment is entirely metaphysical; it includes in particular a refutation of atomism and a study of the principle of the activity of monads. Elsewhere Leibniz invokes the principle of reason to exclude from physics occult qualities, such as attraction, and to demonstrate mechanism: "Omnia in corporibus fieri mechanice." [In bodies, everything occurs mechanically.] (Couturat, *Phil.* I, 15).



also all the successive states of the universe of which it is a mirror or rather a perspective; further, the *pre-established harmony*, which necessarily results from the fact that the monads interact only apparently (*physically*) and not really (*metaphysically*); finally, the ideality of space and time and hence of movement and of bodies, which are reduced to mere "true phenomena," and the immortality not only of souls, but of all substances.<sup>8</sup>

In a word, it is the entire *Monadology* which Leibniz thus progressively derives from the principle of reason and which he presents in rational order and in proper perspective. Actually, the *Monadology* takes as its point of departure this same notion of the monad which is here the conclusion of a long deduction; it reverses the logical construction of the system in a sense and makes the pyramid rest on its peak. In order to convince oneself that the order followed by the *Monadology* is really the inverse of the order that is both logical and genetic, it suffices to notice that one cannot at all see how the principle of reason would follow from the definition of the monad, whereas one understands perfectly how the concept of the monad derives from the principle of reason.<sup>9</sup> The monad is the logical subject elevated to the status of substance; its attributes become the accidents "inherent" in the essence of the substance. It contains in itself the entire sequence of its states (and hence the principle or *law* of their succession), because its essence includes all its past, present, and future accidents. It is a mirror or a perspective of the universe, because its notion implies all the things to which it stands in relation. Now, since there are no purely extrinsic characteristics, every external relation of a substance is expressed by an internal modification, that is, by an accident; and that is why "the monads are

<sup>8</sup> Compare this deduction with that contained in another unpublished fragment, already cited: Couturat, *Phil.* I, 15.

<sup>9</sup> This reversal of the order of the metaphysical theses in the *Monadology* is explained by the late date of this short work (1714).

windowless." Therefore, every reciprocal action between two monads reduces to the correspondence of their respective perceptions, more distinct in the one which is said to act, more confused in the one which is considered to be passive. And this explains the pre-established harmony. In a word, all the metaphysical properties of the "individual substance" derive, by virtue of the principle of reason, from the logical properties which the "complete and singular" idea possesses.<sup>10</sup>

In the second place, one can no longer fail to recognize the absolutely universal applicability Leibniz attributes to the principle of reason. It holds equally for all kinds of truths, *universal* as well as *singular*, *necessary* as well as *contingent*. This is rigorously logical, since the principle constitutes the very definition of truth in general and expresses its "nature."<sup>11</sup> With respect to contingent truths in particular, Leibniz affirms their subordination to the principle of reason with a clarity and an insistence which leave no room for doubt.<sup>12</sup> It follows that *contingent*

<sup>10</sup> Cf. Russell, *A Critical Exposition of the Philosophy of Leibniz*, ch. iv.

<sup>11</sup> "Verum est affirmatum, cujus praedicatum inest subjecto, itaque in omni Propositione vera affirmativa, necessaria vel contingente, universali vel singulari, Notio praedicati aliquo modo continetur in notione subjecti; ita ut qui perfecte intelligeret notionem utramque, quemadmodum eam intelligit Deus, is eo ipso perspiceret praedicatum subjecto inesse." [A statement the predicate of which is in the subject is true, and so in every true affirmative proposition, necessary or contingent, universal or singular, the notion of the predicate is in some way contained in the notion of the subject; and so whoever perfectly understands these notions, in the way that God understands them, thereby perceives that the predicate is in the subject.] (Couturat, *Phil.* IV, 3, a, 1). Cf. the similar passages *De libertate* (L. A. Foucher de Careil, 1857, p. 179); *Lettre à Arnauld*, 14 July 1686 (Couturat, *Phil.* II, 56), cited in *La Logique de Leibniz*, pp. 208, 209.

<sup>12</sup> "Utrumque (namely: necessarium et contingens) aequè certum seu a Deo *a priori* seu per causas cognitum est. Utrumque vi terminorum verum est, seu praedicatum utrobique inest subjecto, tam in necessariis quam contingentibus." [And both (namely: necessary and contingent truths) are known certainly

truths are not synthetic to any degree whatsoever, as is generally believed; they are just as analytic as necessary truths are. But then, it will be asked, how do they differ from necessary truths? They differ from them, replies Leibniz, as the infinite differs from the finite, or as irrational and rational numbers differ.<sup>13</sup> Contingent truths are analytic, as are all truths; only the analysis of their terms is *infinite*, so that we cannot demonstrate them by reducing them to propositions of identity. They are no less identities in the eyes of God, who alone can complete this infinite analysis "in a single act of mind." This is how Leibniz believes he can escape the doctrine of universal necessity (to which he was averse for moral and theological reasons) and how he finds the solution to the difficulty in the consideration of mathematical infinity.<sup>14</sup>

Thus the comparison of contingent truths with irrational numbers is not a simple metaphor, but an analogy which Leibniz develops confidently and with a rigorous parallelism; he states many times that contingency is rooted in infinity,<sup>15</sup> and that it is thanks to mathematics

---

whether *a priori* by God or through analysis of their reasons. And both are true by virtue of their terms, or the predicate is contained somewhere in the subject, as much in necessary as in contingent truths.] (Couturat, *Phil.* VII, B, 11, 71). Cf. *De libertate*: "Sed in veritatibus contingentibus, etsi praedicatum insit subjecto . . ." [But in contingent truths, although the predicate be in the subject . . .] (*Foucher de Careil*, 1857, p. 182) cited in *La Logique de Leibniz*, p. 211, note 2.

<sup>13</sup> "Origo veritatum contingentium ex processu in infinitum, ad exemplum Proportionum inter quantitates incommensurabiles" (Couturat, *Theol.* VI, 2, f, 11-13.) Cf. *Generales Inquisitiones de Analyysi notionum et veritatum*, 1686, §135 (Couturat, *Phil.* VII, c, 29); Couturat, *Phil.* IV, 3, a, 1, and *Ger. Phil.* VII, 200, 309.

<sup>14</sup> "Tandem nova quaedam atque inexpectata lux oborta est unde minime sperabam: ex considerationibus scilicet mathematicis de natura infiniti." [A new and unanticipated light finally arose from the least expected source: namely, from mathematical considerations concerning the nature of the infinite.] *De libertate* (*Foucher de Careil*, 1857, pp. 179-80).

<sup>15</sup> "Contingentiae radix infinitum." [Contingency is rooted in

(to the infinitesimal calculus) that he has been able to understand and explain the nature of contingent truths. Now, as one readily notices, this difficulty (which, by his own account, had long troubled him) exists only as long as contingent truths are analytic: it is a question of understanding how an analytic proposition can fail to be necessary.<sup>16</sup> As soon as contingent truths are considered to be synthetic, the question disappears and the solution no longer has any sense.

\* \* \* \* \*

Is the difficulty thus really resolved? We are far from so affirming. But here (as in our book) we are writing as an historian, not as a critic; we are seeking what Leibniz actually thought and not trying to determine whether he was right or wrong to think it. From this point of view, it is interesting to know how he was led to this theory. He states it expressly: what rescued him from (Spinozistic) fatalism was the consideration of the possibles which are not realized and which, indeed, will never be realized.<sup>17</sup>

---

infinity.] (Bodemann, p. 121). "Ex his apparet radicem contingentiae esse infinitum in rationibus." [From this it appears that the root of contingency is an infinity of reasons.] (Couturat, *Theol.* VI, 2, f, 12).

<sup>16</sup> "Atque ita arcanum aliquod a me evolutum puto, quod me diu perplexum habuit, non intelligentem, quomodo praedicatum subjecto inesse posset, nec tamen propositio fieri necessaria. Sed cognitio rerum geometricarum atque analysis infinitorum hanc mihi lucem accendere, ut intelligerem, etiam notiones in infinitum resolutibiles esse." [And so I thought I had formulated some sort of mystery, which puzzled me daily; I could not understand how the predicate could be in the subject without the proposition being necessary. But my knowledge of geometry and analysis of infinites showed me the light so that I understood that these notions are also infinitely analyzable.] (Couturat, *Phil.* IV, 3, a, 1).

<sup>17</sup> Beginning of *De libertate* (Foucher de Careil, 1857, p. 178). Leibniz there argues against Descartes's assertion (*Principles of Philosophy* III, 46) that matter must assume successively all possible forms. He maintains, on the contrary, that matter can really be infinitely divisible without thereby realizing all possible

In fact, "nothing is necessary of which the opposite is possible".<sup>18</sup> If there are unrealized possibles, then the realized possibles can only be contingent. (These realized possibles comprise the entire real universe: not only individuals but also the general laws of nature.) By 2 December 1676 (the day after his meeting with Spinoza), Leibniz was denying the Spinozistic thesis—"Everything possible exists"—and he was already opposing to it his own theory that only those compossibles containing the greatest reality exist.<sup>19</sup> The point is that not all possibles are compossibles (otherwise there would be no reason why all possibles should not exist).<sup>20</sup> The only *raison d'être* of

---

divisions (v. *Primae Veritates*). Cf. the *Origo veritatum contingentium*: "Si omne quod fit necessarium esset, sequeretur sola quae aliquando existunt esse possibilia (ut volunt Hobbes et Spinoza) et materiam omnes formas posibles suscipere (quod volebat Cartesius)." [If everything which exists were necessary, it would follow that only those things are possible which do in fact in some way exist (as Hobbes and Spinoza hold) and matter would assume all possible forms (as the Cartesians claimed)]. (Couturat, *Theol.* VI, 2, f, 11).

<sup>18</sup> *Discours de métaphysique*, §XIII (Ger. *Phil.* IV, 438).

<sup>19</sup> "Principium autem meum est, quicquid existere potest, et aliis compatibile est, id existere. . . . Itaque nulla alia ratio determinandi, quam ut existant potiora, quae plurimum involvant realitatis." [However, my principle is that whatever is able to exist, and is compatible with the other things, will exist. . . . And so there is no reason determining existence other than the maximization of reality.] (Couturat, *Phil.* VIII, 71). It is unnecessary to add that this text suffices, in our opinion, to destroy the hypothesis of a lasting and dominating influence exercised by Spinoza on Leibniz.

<sup>20</sup> "Ratio existendi prae omnibus possibilibus non alia ratione limitari debet quam quod non omnia compatible." [For there is no reason limiting the existence of everything possible other than the fact that not all possibles are compatible.] (*Ibid.*) This fact, that all possibles are not compatible, is apparently explained by the negation which is necessarily introduced into the complex concepts resulting from the combination of simple concepts. On the contrary, the latter, which Leibniz calls the "primary possibles" and the "absolute attributes of God," are essentially positive and hence compatible. It is thus that the proposition "God

the possibles is their quantity of reality or of essence. Each possible tends toward existence in proportion to its degree of "perfection"—that is, of reality. All the possibles struggle among themselves for existence in the Mind of God, which is "the land of the possible realities,"<sup>21</sup> and the outcome of this struggle is the infallible and automatic (not to say necessary) triumph of the system of compossibles which contains the most essence or "perfection." The world is thus the product of a "metaphysical mechanism" and of a "divine mathematics."<sup>22</sup> The creation is the solution to a problem of maximization, and this maximization has a significance much more metaphysical than moral. Such is the logical origin of Leibnizian optimism; and this is why it is a speculative and intellectual optimism rather than a teleological and practical one.

It is apparent what we must think of the synthetic character generally attributed to existential judgments.<sup>23</sup> First of all, existential propositions are not the only contingent propositions. All the laws of nature are equally so, according to Leibniz, and for the same reason—namely, because they include an infinity of elements or of *conditions* [*réquisits*]. Second, they are analytic in the same sense as the other contingent truths. To make of existence an exceptional predicate, whose affirmation would be synthetic, is quite simply to confuse Leibniz with Kant. For Leibniz, existence is nothing more than *l'exigence de l'essence*; it is contained in the essence and can be de-

---

is possible" is justified—a proposition which is for Leibniz the indispensable premise of the ontological argument. It is for this reason that he said that his Characteristic had the same basis as the demonstration of the existence of God (*Lettre à la duchesse Sophie* [Ger. Phil. IV, 296], cited in *La Logique de Leibniz*, p. 195, note 2). Cf. Couturat, *Phil.* V, 8, f, 25 (April 1679).

<sup>21</sup> *Lettre à Arnauld*, 1686 (*Ger. Phil.* II, 55).

<sup>22</sup> *De rerum originatione radicali*, 1697 (*Ger. Phil.* VII, 304).

<sup>23</sup> Mr. Russell maintains that all existential judgments are synthetic for Leibniz, with the exception of the affirmation of the existence of God, which would be analytic. This exception is nowhere indicated, and it is unjustifiable in Leibniz's system.

duced from it by a simple analysis. *It is wrong*, said Leibniz, to think of existence as having nothing in common with essence; *there is something more* in the concept of what exists than in the concept of what does not exist. And in fact existence consists, *by definition*, in taking part in the most perfect order of things; that is to say, in the system of compossibles which contains the most essence. It is in this sense that existence is a "perfection"—that is, an integrating element of the essence.<sup>24</sup> Such is the reply Leibniz made in advance to the Kantian critique of the ontological argument. Now it is worth noticing that this reply is a logical consequence of the principle of reason: if existence were something other than a requirement of the essence, it would be necessary to seek the reason for existence elsewhere—that is, in another essence.<sup>25</sup> In other words, existence is an attribute which, like every other attribute, must be contained in the subject to which

<sup>24</sup> ". . . Existentia a nobis concipitur tanquam res nihil habens cum Essentia commune, quod tamen fieri nequit, quia oportet plus inesse in conceptu Existentis quam non existentis, seu existentiam esse perfectionem; cum revera nihil aliud sit explicabile in existentia, quam perfectissimam seriem rerum ingredi." [We conceive of Existence as having nothing in common with Essence, which is nevertheless not the case, because it is necessary that there be more in the concept of that which exists than of that which does not exist, if existence is a perfection; for indeed nothing would be explicably in existence except as participating in the most perfect order of things.] (Couturat, *Phil.* I, 14, c, 7 v°).

<sup>25</sup> "Si Existentia esset aliud quiddam quam Essentiae exigentia, sequeretur ipsam habere quandam essentiam seu aliquid novum superaddere rebus, de quo rursus quaeri posset an haec essentia existat, et cur ista potius quam alia." [If Existence were something other than the exigency of Essence, it would follow that this itself would have some essence and something new would be added to things about which one again could ask whether this essence existed, or why this one rather than that.] (*Ger. Phil.* VII, 195, note). [Editor's note: It should be noted that this interpretation requires a rather different reading of the maxim *nihili nullae proprietates sunt* than Benson Mates gives it in his article "Leibniz on Possible Worlds," which is included in the present volume.]

it belongs; otherwise existential judgments would have no "reason." Here as everywhere else, *praedicatum inest subiecto*.

Here an objection arises which we find in a variety of critiques of Leibniz: "Logic has doubtless only to analyze the subjects once they are formulated, but it is metaphysics which formulates them; thus logic is subordinate to metaphysics, all things considered, as is analysis to synthesis." This objection is in a thoroughly modern spirit; Leibniz would not have admitted it, nor perhaps even have understood it. In fact, for him synthesis (like analysis) is a function of logic, of that *Real Logic* which he identified with metaphysics.<sup>26</sup> It is logic, and more specifically *the art of discovery*, which must generate all the possible concepts and which will thus construct the subjects which *the art of judgment* will have to analyze. This inventive and synthetic branch of logic, the most important in his eyes, Leibniz often calls Combination (*la Combinatoire*), because it is the art of combinations which directs the ordered formation of complex concepts by means of the simple and primitive concepts which are the "primary possibles." Human Combination can only imitate and imperfectly reproduce the divine Combination, which gives rise to all the possibles which, as we have seen, struggle for existence. Now by the mere fact that each of these possibles is the combination of a certain number of "primary possibles," it possesses a certain degree of reality. It is this quantity of essence it contains which constitutes its right to existence, and which, if it is realized, will be the "cause" or the "sufficient reason" of its realization. In a word, one can say that its existence is prescribed [*inscrite d'avance*] in its essence, that it is a part of its meaning. Only, in order to extract the ex-

<sup>26</sup> "J'ay reconnu que la vraye Metaphysique n'est guères differente de la vraye Logique, c'est-a-dire de l'art d'inventer en general." [I recognized that the true metaphysics hardly differs from the true logic, that is, from the art of discovery in general.] *Lettre à la duchesse Sophie* (Ger. Phil. IV, 292).



istence from the essence, an infinite analysis, indeed an infinitely infinite analysis, would be necessary. It would be necessary to relate this possible to the possible world it implies, and to compare this world with all the other possible worlds. That is why this existence is contingent, inasmuch as it implies an infinity of logical conditions [*réquisits*]. One must not say, accordingly, that logic receives its subjects ready-made from metaphysics; quite the contrary, it is metaphysics which receives its objects (the real beings) from logic and above all from that divine logic which presides at the creation: *Cum Deus calculat . . . , fit mundus*.

\*            \*            \*            \*            \*

It will undoubtedly be objected that the choice among possibles is mechanical only apparently and metaphorically. According to Leibniz's own statements, this choice results from the *free* decrees of God. It depends not on his intelligence, but on his will; not on his wisdom, but on his goodness. Let us therefore examine what Leibniz means by freedom, in man and in God.

We know that he defines freedom as an intelligent or rational spontaneity. Now the spontaneous is that which contains within itself its principle of action.<sup>27</sup> Freedom thus consists in the ability to act or not to act (or to act otherwise), given the same *external* conditions: for action depends on the *internal* dispositions of the agent, and notably on its intelligence. Peter and Paul are *free* because, placed in exactly the same conditions, they will act or react differently. This is not to say that they will act irrationally, nor that their action is undetermined. It has its (logical) reasons in their individual natures; it is contained from all eternity in the notions of "Peterhood" and "Paulhood."<sup>28</sup> Also, God can foresee their action with certainty and infallibility. This freedom has nothing in common with the freedom of indifference, which would be the

<sup>27</sup> Couturat, *Phil.* IV, 3, c, 13.

<sup>28</sup> *Scientia media*, Nov. 1677 (Couturat, *Phil.* IV, 3, c, 15).

power to act or not to act, given all the external and *internal* conditions of the action. That, according to Leibniz, is an "impossible chimera," since it is obviously contrary to the principle of reason.<sup>29</sup> He remarks that this conception of freedom was unknown to the ancients and to the great scholastics, and that it originates with the Jesuits (Fonseca and Molina). And to the moderns who reproach him with ignorance of the true idea of free will, Leibniz would undoubtedly reply by asking them if they themselves understand their empty concept of an irrational and undetermined activity, and if they can really think something which violates, by definition, the laws of thought.<sup>30</sup>

Thus freedom, no more than the contingency of which it is but a special case, by no means excludes determinism. On the contrary it implies it, because freedom consists in the determination of action by reason.<sup>31</sup> Spontaneous and intelligent action is *free* only in the sense that it is unpredictable, because it escapes every general law. In this respect, freedom constitutes a higher degree of contingency. For, as we have seen, the laws of nature

<sup>29</sup> Couturat, *Phil.* IV, 3, c, 13.

<sup>30</sup> It is unnecessary to note that the "contingence" he attributes to the laws of nature has nothing in common with what our modern "irrationalists" mean thereby. Leibniz summarized his theory of contingency in this concise formula: "Nulla est in rebus singularibus necessitas, sed omnia sunt contingentia. Vicissim tamen nulla est in rebus indifferentia, sed omnia sunt determinata." [There is no necessity in things; everything is contingent . . . on the other hand, however, there is no indifference in things; everything is determined.] (*Ger. Phil.* VII, 108).

<sup>31</sup> This notion of freedom is much closer to Kant's than is generally believed. In fact, the concept of freedom as independence of natural laws is for Kant only a negative concept; freedom consists not in the absence of all determination, but in the determination of the will by reason. Kant explicitly states: "a free will (that is, without law) would be an absurdity." (*Groundwork of the Metaphysics of Morals*, 3rd section). Freedom too has its laws; this is why Kant constantly talks of "causality by freedom." A free will is a will submitted to the moral law; the positive concept of freedom is autonomy.

are already contingent to the same degree as nature itself; but free actions are independent of the laws of nature, not at all because they violate or suspend these laws but because these laws, being *general*, do not suffice to determine the individual action of "intelligent substances." It is in fact intelligence which delivers man from physical determinism, because it complicates to *an infinite degree* the processes which determine his action (namely, attention and reflection) in such a way that one can never predict with certainty which motive will prevail in him. Human actions are, strictly speaking, "incalculable," at least for a finite understanding; but this does not prevent them from being absolutely determined in themselves, nor does it prevent God from knowing them in advance—not through a simple "visual knowledge," which would be nothing but a purely empirical foresight, but through an "intelligent knowledge" which permits him to see its reason and, if necessary, to "give reason to it."<sup>32</sup>

From the psychological point of view, the will is always determined by the apparent good; it tends toward it irresistibly.<sup>33</sup> All differences among individuals, and among their actions, thus derive from the intelligence—that is, from the more or less perfect knowledge of the good. Here again one sees how the intelligence is the condition of freedom. It furnishes the determining motives for action and, through more or less attentive and prolonged reflection, it causes a real good to be preferred over an apparent good; that is, it causes the motive that is rightfully strongest to triumph instead of the one that prevailed at first. It is this operation of reflection which, infinitely complicating the givens of the problem, makes its solution incal-

<sup>32</sup> *Scientia media*, Nov. 1677 (Couturat, *Phil.* IV, 3, c, 15).

<sup>33</sup> "Voluntatis objectum esse bonum apparens, et nihil a nobis appeti nisi sub ratione boni apparentis, dogma est vetustissimum communissimumque." [The object of the will is the apparent good, and we desire nothing except under the form of apparent good. This belief is very old and widespread.] (Couturat, *Phil.* IV, 3, c, 13).

culable and unpredictable. The entire difference between the will of man and that of God comes from the difference in their intelligences. The former chooses the apparent good, the latter the real good. Or rather both equally choose the apparent good; only it is clear that what appears good to God is the absolute and real good. It could, in one sense, be said that man is freer than God, for the weakness of man's intelligence gives rise to all sorts of depravities and perversions which make him prefer, under the aspect of apparent goods, evils which are all too real. God, on the other hand, can will only the good; he is in some sense condemned by his infinite wisdom to realize the good unfailingly. This is what the freedom of choice attributed to him comes down to.

But then, it will be said, in what does this "good" or this "better" which God wills and infallibly realizes finally consist? What is the significance of distinguishing his wisdom from his goodness, if his will is entirely determined by his intelligence? From the metaphysical point of view this distinction vanishes, since not only the divine will but *all* will, however perverse, tends essentially toward the good. Moreover, this "good" which is the object of the creating will does not have, nor could it have, any *moral* character. It consists uniquely in metaphysical "perfection"—that is, in the degree of essence or of reality—so that the "principle of perfection" reduces to "God realizes the maximum of essence or of reality," which is a simple consequence of the principle of reason.

\* \* \* \* \*

There remain one or two apparently insurmountable objections. What becomes, in our interpretation, of the famous distinction between efficient and final causes and of the no less classic distinction between mechanical and metaphysical principles? In order to appreciate the first, one must remember the circumstances in which Leibniz enunciated and adopted it. In 1682 he published his *Uni-*

*cum opticae, catoptricae et dioptricae principium*,<sup>34</sup> in which he deduced all the laws of the reflection and refraction of light from this single principle: *Lumen a puncto radiante ad punctum illustrandum pervenit via omnium facillima*. [Light travels from the radiating point to the point to be illuminated via the easiest path.] And it is to this memorandum that he repeatedly refers when he maintains (against the Cartesians) the usefulness of studying final causes. Now (without emphasizing what is artificial and paradoxical in considering the "point to be illuminated" as the end toward which the illuminating ray tends, when the rays spread out into space without seeking to illuminate what happens to be there), it suffices to remark that this (apparent) finality translates simply into a problem of maximum and minimum, to which it is difficult to attribute a moral significance. Moreover, the scientific interest in the consideration of finality is not only that the "best" consists in a maximum or a minimum. It is above all that it corresponds to a particular determined instance, mathematically speaking, to a *singularity*. Leibniz recognizes this implicitly in the same passages in which he exalts the "principle of perfection." The forms he calls the "best" are those "which provide a maximum or a minimum"; "nature acts along the shortest paths, or at least along the most determined paths," or again, "God acts in the easiest and the most determined ways." It is apparent that what is essential in this finality that Leibniz investigates is not a quantitative maximum or minimum; it is rather the logical or mathematical *determination* of the problem to be resolved. This is what Leibniz finds the "most beautiful" in the idea.<sup>35</sup> It

<sup>34</sup> L. Dutens, ed., *God. Guil. Leibnitii . . . Opera omnia*. (Geneva, 1768), III, 145.

<sup>35</sup> V. the *Tentamen Anagogicum*, "où l'on monstre . . . que dans la recherche des Finales il y a des cas où il faut avoir égard au plus simple ou plus déterminé, sans distinguer si c'est le plus grand ou le plus petit." [in which one shows . . . that in the study of Finalities there are cases where one must be concerned

suffices to say that the *beauty* and *goodness* in question here are entirely rational and metaphysical, having no teleological or moral significance.<sup>36</sup>

Let us go on to the distinction between mechanical and metaphysical principles. What exactly does Leibniz mean when he endlessly repeats that if everything in nature is explained by mechanical laws, then these mechanical laws themselves rest on metaphysical principles? Perhaps one already suspects: these metaphysical principles are the principle of reason and all its corollaries. And if these principles have a *logical* and not a *moral* character, it follows that Leibniz's mechanics is subordinated to his logic and not to his theory of morals or to his theodicy. Moreover, the *finality* Leibniz thinks he has discovered in the laws of mechanics is not of a different nature from that which he recognized in the laws of optics. In all the instances in which he appears to subordinate *mathematical* principles to *metaphysical* principles, he is really subordinating them to the principles of his logic, as is shown by the allusions he makes in those instances to the Universal Characteristic.<sup>37</sup> Indeed, according to him, popular mathematics—the sciences of number and of size (objects of imagination)—depend on a more general science. Sometimes he called this more general science the Combinatory [*la Combinatoire*] or Art of Discovery; sometimes he called it the Universal Mathematics, because it would subordinate to a rigorous calculus even abstract notions which do not depend on the imagination, such as those of metaphysics and mechanics.<sup>38</sup>

---

with the simplest or the most determined, without distinguishing whether it is the largest or the smallest.] (*Ger. Phil.* VII, 270).

<sup>36</sup> Cf. *La Logique de Leibniz*, pp. 230–32.

<sup>37</sup> See especially the end of the *Réponse aux réflexions de M. Bayle* (1702), cited and commented on in *La Logique de Leibniz*, p. 238.

<sup>38</sup> "Constat principia naturae non minus metaphysica quam mathematica esse, vel potius causas rerum latere in metaphysica quadam mathesi quae aestimat perfectiones seu gradus realitatum." [The principles of nature are not less metaphysical than

This is also evident from certain unpublished texts which date from Leibniz's youth. In the *Consilium de Encyclopaedia nova conscribenda methodo inventoria* (June 1679) he said of mechanics (which he called *scientia de actione et passione, de potentia et motu*): *Haec scientia Physicam Mathematicae connectit. Neque hic agitur quomodo delineanda sint motuum . . . vestigia: id enim pure geometricum est;*<sup>39</sup> *sed quomodo ex corporum conflictu motuum directiones et celeritates im-  
mutentur: quod per solam imaginationem consequi non licet, et sublimioris est scientiae.*<sup>40</sup> [This science connects physics with mathematics. And it is not here a question about tracing the paths of motion, for that is a purely geometrical task; rather it is a question of how the direction and speed of motion are changed through the collision of bodies. This cannot be ascertained through the imagination alone and is a question for a more sublime science.] Mechanics does not reduce to geometry nor even to cinematics, because of the mass which intervenes in collisions to modify the movements; it is this element—the mass, revealed by the active force—which escapes the spatial “imagination” and prevents the geometric prediction of the result of the collision, which Descartes thought possible.<sup>41</sup> Mass and active force are what Leibniz invoked

---

mathematical, or rather the causes of things lie in a certain mathematical metaphysics which calculates the perfections and the degrees of reality.] (*Ger. Phil.* II, 213). This “metaphysical mathematics” is the Characteristic or Combinatory: one sees that its object is to calculate the degree of reality of the *possibles*, and thus to explain the *real* by a simple analysis.

<sup>39</sup> This is the definition of cinematics, which Leibniz (as well as Kant) calls “Phoronomy.”

<sup>40</sup> Couturat, *Phil.* V, 4 v<sup>o</sup>.

<sup>41</sup> “Quanti autem momenti sit, recte constitui principia hujus Matheseos vel Physico-Matheseos tam late patentis, quae considerationem virium (rem imaginationi non subditam) addit Geometriae deo scientiae imaginum universali, facile intelligis.” [However, as to the quantity of motion, you will easily see that I correctly established the principles of this Mathematics or Physico-Mathematics which is so broadly applicable and which

when he maintained (against the Cartesians) that the essence of body does not consist in extension. This is indeed the major point on which he breaks with the Cartesian mechanism or rather with its "geometrism." What, then, is this "more sublime science" which will permit the treatment of the problems of mechanics and the penetration of nature? Is it metaphysics? By no means. It is Logic, or Characteristic. Here in fact is what Leibniz wrote in May 1676: *Vera ratiocinandi ars in rebus difficilibus et nonnihil abstrusis, quales sunt physicae, frustra speratur, quamdiu non habetur ars characteristica sive lingua rationalis, quae mirifice in compendium contrahit operationes mentis, et sola praestare potest in Physicis, quod Algebra in Mathematicis.*<sup>42</sup> [The true art of reasoning in difficult and profound matters, such as those of physics, will be sought in vain as long as we do not have an art of characteristic or a rational language, which will wondrously unify mental operations and which alone will be able to serve Physics as Algebra does Mathematics.] And this idea—that the Characteristic is the logic of physics,<sup>43</sup> and the true experimental method<sup>44</sup>—reappears constantly

---

supplements Geometry or the science of universal imagination by consideration of forces (which cannot be subsumed under things of the imagination).] (*Ger. Math.* III, 243).

<sup>42</sup> Couturat, *Phil.* V, 8, g, 30-31.

<sup>43</sup> See, for example, the beginning of the *Pacidius Philalethi* (October 1676), which is published in its entirety in Couturat, *Math.* X, 11, and the end of the *De modo perveniendi ad veram corporum analysin et rerum naturalium causas* (May 1677), in which he says: "Haec autem [the analysis of physical qualities] per definitiones et linguam philosophicam egregie fient." [This however can be achieved splendidly through definitions and a philosophical language.] (*Ger. Phil.* VII, 269).

<sup>44</sup> "Ars characteristica ostendet non tantum quomodo experimentis sit utendum, sed et quanam experimenta sint sumenda et ad determinandam rei subjectae naturam sufficientia . . ." [The art of Characteristic will show not only how experiments are to be interpreted, but also which experiments are to be undertaken and which are sufficient for determining the nature of the subject in question . . .] (Couturat, *Phil.* V, 8, g, 31).



in the writings of this period. Later he enumerated among the many applications of his universal characteristic the science of cause and effect, of action and passion, i.e., mechanics: "I reduce all mechanics to a single proposition of metaphysics, and I have several important geometrical propositions concerning cause and effect."<sup>45</sup> Now the "metaphysical" principle from which Leibniz deduces all of mechanics is this: "There is always a perfect equation between the full cause and the entire effect."<sup>46</sup> This really means that something remains constant in mechanical phenomena (notably in collisions); and it is this "something" which Leibniz calls "force," as we shall see later. For the moment it is enough to remark that, by virtue of its entirely formal character, this proposition is more a logical than a metaphysical principle, and that in any case it has no teleological significance.<sup>47</sup>

This leads us to explain briefly our position regarding the similarities between Leibniz's metaphysics and his mechanics, similarities which have been peculiarly exaggerated and misrepresented. We do not mean that the studies of mechanics Leibniz pursued from 1678 to 1686 (evident from his unpublished manuscripts<sup>48</sup>) had no influence *whatsoever* on the formation of his system, but rather that they were no more influential than his other

<sup>45</sup> *Lettre à Arnauld*, 14 July 1686 (*Ger. Phil.* II, 62). Cf. *Lettre à Foucher*, 1687 (*Ger. Phil.* I, 391); *Lettre à Arnauld*, 14 Jan. 1688 (*Ger. Phil.* VII, 199); these texts are cited in *La Logique de Leibniz*, p. 304.

<sup>46</sup> *Ger. Phil.* III, 45. Cf. *Essai de Dynamique* (Foucher de Careil, I, 653).

<sup>47</sup> Just when we finished this article, we received Mr. Cassirer's study, *Leibniz' System in seinen wissenschaftlichen Grundlagen* (Marburg, Elwert, 1902), in which (despite certain divergences in interpretation) we found a valuable confirmation of the thesis we are here holding. Mr. Cassirer states as we do that what Leibniz calls "metaphysical principles" are really logical principles and remarks that he criticized the theological considerations from which Descartes claimed to deduce the *law of conservation* in mechanics (pp. 315-16).

<sup>48</sup> See Bodemann, pp. 301-2, 328-29.

scientific studies. Everything considered, his metaphysics inspired his mechanics much more than vice versa; and his metaphysics follows essentially from the logical principles Leibniz adopted at a very early date. We by no means deny that his metaphysics, like all metaphysics worthy of the name, was nourished by critical scientific study, of *all* the sciences (and not merely of one, as is too frequently believed). But this critical study was itself constantly directed by certain *a priori* principles, metaphysical or logical (the name matters little), of the sort we have just mentioned and which Leibniz, far from borrowing from experience, employed to judge and to explain experience.<sup>49</sup>

And now, we must put an end once and for all to that conception of the monad which is still advanced in textbooks and courses and even in certain scientific works,<sup>50</sup> namely, that monads are *forces* (the more scholarly say "centers of force"). To refute this totally, it ought to suffice to recall that *Leibniz never admitted what we call a force in mechanics*. We know how he protested against the hypothesis of attraction, accusing Newton of reinstating the occult qualities of the scholastics, which violate the principle of reason.<sup>51</sup> In the *Tentamen de motuum caelestium causis* (1689), which he proposed in opposition to the Newtonian theory, he excluded all action at a distance and tried to explain the movement of the stars by the pressure of a fluid in which they are immersed.<sup>52</sup> It is a commonplace to oppose Leibniz's *dynamism* to the *mechanism* of Descartes. This distinction does not have

<sup>49</sup> Cf. Cassirer, *op. cit.*, pp. 308 ff., and the texts cited there.

<sup>50</sup> Dühring, *Geschichte der mechanischen Prinzipien*, p. 229 (cited by Cassirer, *op. cit.*, p. 314).

<sup>51</sup> *Antibarbarus physicus pro philosophia reali, contra renovationes qualitatuum scholasticarum et intelligentiarum chimaericarum* (Ger. Phil. VII, 337); cf. Couturat, *Phil.* I, 15, §2.

<sup>52</sup> "Omnia corpora quae in fluido lineam curvam describunt, ab ipsius fluidi motu agi" since bodies can interact only through contact. [All bodies which describe a curve in a fluid are set in motion by that fluid.] (Ger. Math. VI, 149, 166).

the slightest justification. Leibniz is as much a mechanist as Descartes; even more so, for he is a rigorous determinist. If he modifies the formulas of Cartesian mechanics he nonetheless entirely accepts its principle, which is to explain all natural phenomena by collisions or contacts *without the intervention of any force*. What Leibniz calls *force*, and sometimes even *motor force*, is always *active force*.<sup>53</sup>

It seems however that his theory of active force suggested to him his idea of substance, and he himself often presents the latter as a consequence of the former. For example, in the *De causa gravitatis* (1690), after having opposed the *motor force*, which alone is constant, to the quantity of motion, which varies, he concludes: *Unde etiam discimus aliquid aliud in rebus esse quam extensionem et motum*.<sup>54</sup> [Wherefore we say *there is something in things other than extension and motion*.] This idea goes back to 1686, when Leibniz published his *Brevis demonstratio erroris memorabilis Cartesii*.<sup>55</sup> Summarizing this memorandum in the *Discours de métaphysique*, §17, Leibniz draws from it the following conclusion: "The distinction between the force and the quantity of motion is important, among other things, in showing that one must return to metaphysical considerations separate from extension in order to explain bodily phenomena."<sup>56</sup> But this consideration has for him only a negative and polemical value. He used it only to prove, against the Cartesians, that "the essence of body does not

<sup>53</sup> One must radically distinguish between primitive force (*vis primitiva*), a metaphysical quality which Leibniz attributes to the monads, and derived force (*vis derivativa*), which is a mechanical and *phenomenal* property of bodies (cf. Cassirer, *op. cit.*, p. 315). Here we are speaking only of the latter.

<sup>54</sup> *Ger. Math.* VI, 202. One reads, on the same page: "VIREs MOTRICES, id est, eas quae conservandae sunt." [MOTOR FORCES, they are what are to be conserved.]

<sup>55</sup> *Ger. Math.* VI, 117.

<sup>56</sup> Summary of §18 of the *Discours de métaphysique* in the *Lettre au landgrave* of 11 Feb. 1686.

consist in extension" (and especially to humiliate them by showing that their master committed gross scientific errors); but it was of no use to him for the discovery and positive determination of this "essence." Moreover, even this negative thesis itself does not originally derive from mechanical considerations, but rather from logico-metaphysical speculations on the nature of substance, which Leibniz summarized in the following way: "If body is a substance and not merely a simple phenomenon like the rainbow nor a being united by accident or through aggregation like a heap of stones, then it cannot consist of extension, and one must necessarily conceive something which one calls substantial form and which corresponds in some sense to the soul."<sup>57</sup> Now this thesis proceeds from the remark that, since extension is infinitely divisible, one could not discover any unity in it nor, accordingly, any substantiality.<sup>58</sup> Should one therefore say that Leibniz's metaphysics depends on his geometry? This would indeed be more exact than to make it depend on his mechanics: for he already professed this thesis in his first *Lettre à Arnauld* (1672),<sup>59</sup> at a period when he had ideas totally different from his mechanical theories of the future, and when, on the contrary, he believed he could explain all mechanical phenomena geometrically.<sup>60</sup> Finally, in the *Discours de métaphysique* itself, the thesis "that the notions which rely on extension include something imaginary and could not constitute the substance of body" (§12)

<sup>57</sup> Cf. *Lettre à l'électrice Sophie*, 4 Nov. 1696: "Mes méditations fondamentales roulent sur deux choses, sçavoir sur l'unité et sur l'infini." [My basic meditations concern two topics, namely, unity and infinity.] (*Ger. Phil.* III, 542); cf. *Primae Veritates*.

<sup>58</sup> *Lettre à Arnauld*, 14 July 1686. Cf. *Primae Veritates*.

<sup>59</sup> *Ger. Phil.* I, 72.

<sup>60</sup> See Hannequin, *Quae fuerit prior Leibnitii philosophia . . . ante annum 1672*, p. 110 (Masson, 1893). From 1669 Leibniz made the essence of matter consist in *antitype* or impenetrability (*Lettre à Thomasius*, *Ger. Phil.* I, 17). In 1670 he made it consist in motion, in *velocity* (*Hypothesis physica nova*), from which he concluded that mechanics is reducible to geometry.

comes well before the considerations regarding active force (§18) and is established independently of these latter. Let us therefore conclude that the concept of substance owes nothing to Leibniz's mechanics and proceeds uniquely from his logical and metaphysical principles.

It is the same with the pre-established harmony, which is the keystone of the system. Without doubt, in what he wrote toward the end of his life, Leibniz seems to recognize that this "hypothesis" derives from his mechanical conceptions. In the *Theodicy* (§61), after having recalled his law of active force, he says: "If this rule had been known to M. Descartes . . . , I believe that it would have led him straight to the hypothesis of the pre-established harmony, to which these same rules have led me."<sup>61</sup> About the same time, he persuaded Christian Wolff to study mathematics rather than philosophy, *præsertim cum ipsa Mathematica potissimum juvent philosophantem, neque ego in Systema Harmonicum incidissem, nisi leges motuum prius constituissem, quae systema causarum occasionalium evertunt*,<sup>62</sup> [chiefly because Mathematics is a very powerful aid in philosophy, and I would not have arrived at my System of Harmony unless I had previously known the laws of motion which overthrow the systems of occasional causation]. This is undeniably quite unequivocal. But alas, Leibniz's memory deceived him on this point. This is explained by the fact that discussions regarding mechanics had assumed an important role in his battle against the Cartesians and against Malebranche, and thus were inextricably intermingled in his later exposition of his system. For he wrote in 1686: "The hypothesis of concomitance follows from my notion of substance,"<sup>63</sup> and this notion, as we have seen, has a purely logical origin. Moreover, this hypothesis is established in §14 of the *Discours de métaphysique* by reasons

<sup>61</sup> Cf. *Monadology*, §80.

<sup>62</sup> *Briefwechsel mit Chr. Wolf*, ed. Gerhardt (1860), p. 51.

<sup>63</sup> *Projet de lettre à Arnauld* (*Ger. Phil.* II, 68); see the development which follows (p. 70).

of a metaphysical nature and independently of any mechanical consideration: "God produces diverse substances according to the different viewpoints he has of the universe, and through the intervention of God the individual nature of each substance ensures that what happens to one corresponds to what happens to the others, without their acting directly upon one another." But there is a yet more decisive proof. It is an unpublished text, dated 1676, in which one finds such statements as these: Every soul perceives the entire universe, but confusedly; these confused perceptions constitute sensations; God created a multitude of souls in order to have as many different perspectives of the world. In this text Leibniz again declares himself an advocate of atoms (and of spherical atoms!), which he tries to reconcile with the plenum by means of the idea of infinitely small particles.<sup>64</sup> Here is, it seems to us, a decisive proof that his essential metaphysical theses are well prior to his mechanical theories, to which they owe absolutely nothing.<sup>65</sup>

Furthermore, if one analyzes these theories themselves

<sup>64</sup> Couturat, *Phil. I*, 14, c, 8.

<sup>65</sup> Certain texts which seem contrary to our thesis really only confirm it. For example, Leibniz said with respect to his Dynamics: "Vous avez raison, Monsieur, de juger que c'est en bonne partie le fondement de mon système, parce qu'on y apprend la différence entre les vérités dont la nécessité est brute et géométrique, et entre les vérités qui ont leur source dans la convenance et dans les finales." [You are right, Monsieur, to think that it is in large part the basis of my system, because one sees in it the difference between those truths whose necessity is brutish (*brute*) and geometrical and those truths which have their source in purpose (*convenance*) and in finalities.] There follows the classical allusion to the *Phaëdo* (*Lettre à Remond*, 22 June 1715; *Ger. Phil.* III, 645). We see in what sense mechanics could be said to serve as the basis of the system: it is not at all that it gives rise to the concept of substance but rather that it confirms the principles of Leibnizian logic. And yet it is able to provide only a confirmation: for we know, from texts *contemporaneous* with the formulation of the system, that the theory of contingent truths was suggested to Leibniz by his infinitesimal calculus. See above, notes 14 and 16.

one finds nothing in them which could justify either the concept of the monad or, especially, the hypothesis of the pre-established harmony. As Mr. Cassirer has shown perfectly, the law of the conservation of (active) force never had for Leibniz anything but a purely phenomenal value—like motion, mass, and space itself.<sup>66</sup> If Leibniz could for a moment have dreamed of making a substance of the active force (as certain modern thinkers make a substance of energy), that would have brought him to a *monistic* and not to a *monadistic* metaphysics; for the active force of each body varies, and it is only the sum of the active forces which is constant. Shall we then say that the analysis of elastic collision led him to think that every body really is moved only by its own elastic forces which operate, it is true, upon contact with other elastic bodies? But we do not see how this concept would refute the hypothesis of occasionalism, with which it seems perfectly compatible. Actually, it is for purely logical reasons that Leibniz denies all “physical impulse” and all real action of one substance on another, and the phenomenon of elastic collision is nothing for him but a confirmation after the fact, or rather a simple “experimental illustration” of his metaphysical theses. The pre-established harmony is no more a consequence of the laws of mechanics than the monad is an atom or a billiard ball.

<sup>66</sup> “Vires quae ex massa et velocitate oriuntur derivativae sunt et ad aggregata seu phaenomena pertinent.” [The forces which arise out of mass and velocity are derivative and belong to the aggregate or the phenomena.] *Lettre à de Volder* (*Ger. Phil.* II, 251). “Vires derivativas ad phaenomena relego.” [I relegate the derived forces to phenomena.] (*Ger. Phil.* II, 275). “Qualia autem corpora pono, tales et vires corporeas, nempe ἐν τοῖς φαινομένοις.” [However I of course put corporeal qualities such as corporeal forces among the phenomena.] (*Ger. Phil.* II, 276).





# PHILOSOPHICAL REFLECTIONS OF LEIBNIZ ON LAW, POLITICS, AND THE STATE

CARL J. FRIEDRICH

It has been claimed and on high authority that "throughout the numerous fields of Leibniz's activity—from mathematics to metaphysics, from geology to engineering, from politics to theology, from physics and chemistry to economics, from history to linguistics—there runs a persuasive inner unity, which must be grasped for a full understanding of his work."<sup>1</sup> It is a persuasive plea, and an understandable one. There is a natural tendency to proceed on the assumption that a great thinker is a consistent one, and hence to proceed to resolve or explain away the glaring contradictions which virtually every thinker, no matter how remarkable, displays, and some of the most renowned in the most striking degree. But the writer of the cited passage may well object that even though such contradictions are to be admitted and indeed insisted upon, the "persuasive inner unity" is another question, as indeed it to some extent is. For such unity may in fact embrace the very contradictions and thus make them reap-

Copyright © 1966 *Natural Law Forum*. Reprinted from *Natural Law Forum*, vol. 11 (1966) by permission of the author and the editor of *Natural Law Forum*.

<sup>1</sup> Gottfried Wilhelm von Leibniz, *Monadology and Other Philosophical Essays*, intro., ix (ed. Paul and Anne Martin Schrecker, 1965).

pear in various fields. That there are some red threads which run through most, if not all, of Leibniz's works, there can be no doubt. Harmony, for example, is a recurrent theme, and so is the reconciliation of opposites—to use the Hegelian phrase. Still, it would seem more appropriate to treat this question as an open one, lest one be seduced into speculative constructions for which no adequate basis can be found in Leibniz's own writings.<sup>2</sup>

Law and politics were central concerns of Leibniz. Trained as a jurist, he retained a lifelong interest in the subject of jurisprudence and legal philosophy. As a practical politician, diplomat and statesman, and as the organizer of numerous scholarly and scientific enterprises, he acquired a feel for the world of power and an understanding of government and the state which are reflected in numerous writings and in his correspondence. Yet it would seem that the extraordinary imaginative originality which characterizes his work as a metaphysician and mathematician is lacking in the field with which we here are concerned. Recurrent claims to the contrary have not succeeded in establishing Leibniz as a thinker of the first rank on law and politics; no basically novel insight can be attributed to him.<sup>3</sup>

<sup>2</sup>Leibniz's writings are still to a considerable extent unpublished; the great *Akademieausgabe* is progressing at a snail's pace. In the meantime, the well-known selections and editions by Dutens, Erdmann, Klopp, Gerhardt, *et al.*, remain our primary reference material; cf. the helpful note in the introduction cited in note 1. Cf. also Emile Ravier, *Bibliographie des oeuvres de Leibniz* (1937).

<sup>3</sup>The most carefully documented claim on behalf of Leibniz's originality as a political theorist (*Staatslehre*) was advanced by Erwin Ruck, *Die Leibnizische Staatsidee aus den Quellen dargestellt* (Tübingen, 1909); it is a very helpful study, even though its claims cannot be accepted, because they are based on an inadequate familiarity with other writings and the tradition Leibniz followed. On p. 15, fn. 32, Ruck cites several older German works which advanced comparable arguments in the field of legal theory and philosophy. Recent histories of legal philosophy, such as Alfred Verdross, *Abendlaendische Rechtsphilosophie*

For the political theorist, it is an interesting question what significance Leibniz's activities in the practical realm may have for an interpretation of his political philosophy. Not only his concern for the reunion of the several faiths—an interest he shared with Grotius and many other philosophical spirits of his century—suggests this, but more particularly his secret negotiations with the French which were intended to induce the latter to attack Egypt and thereby to deflect their own aggressiveness, while at the same time forcing the Turks to defend themselves in Egypt and therefore to desist from further attacks upon Austria and the *Reich*.<sup>4</sup> The fact that the scheme failed does not of course mean that it does not reveal Leibniz's way of thinking about politics. For clearly such a scheme involves both reason of state and balance of power reasoning. In his *Raisons touchant la guerre ou l'accomodement avec la France*,<sup>5</sup> Leibniz reveals himself even more clearly as a subtle politician, weighing the various interests, and, as his learned editor rightly comments, "in each new formulation Leibniz's argumentation presents more clearly and logically the necessity of an agreement and understanding with the French in order to free the rear for a fight against the Turks."<sup>6</sup> In his satirical comment on French policy entitled *Mars Christianissimus* (1683), Leibniz makes it quite clear that most men have "the habit of regarding their particular interest rather than the public good, and the present rather than the future"<sup>7</sup>—a fairly realistic estimate of man's political behavior, but not exactly original.

Why then, it may be asked, should time be spent on

---

(1958), have not argued that Leibniz's views were highly original. Cf. also my *The Philosophy of Law in Historical Perspective*, 115ff. (Chicago, 2nd ed., 1963).

<sup>4</sup> "Consilium Aegyptiacum," *Akademieausgabe*, IV, 2, pp. 215ff.

<sup>5</sup> *Ibid.* at 503ff.

<sup>6</sup> *Ibid.* at xxiii.

<sup>7</sup> *Ibid.* at 471.

this subject, even on an anniversary date? I believe there are two good and sufficient answers to this question. On the one hand, significant light falls upon some of the more obscure points in his metaphysics, if his political and jurisprudential views are taken into account. And on the other hand, his views, while not entirely novel, are yet highly interesting in themselves because of the central importance of the political dimension in the history of philosophy.<sup>8</sup> Virtually every major philosopher was first and foremost a political philosopher, a mind stirred to its depth by the particular crisis in the political order to which he belonged, and preoccupied with the question how to find a lasting solution to the disorder around him. Plato, Aristotle, Thomas Aquinas, Hobbes, Kant, and Hegel provide especially striking instances of this general phenomenon; the few seeming exceptions, such as Descartes, reveal themselves upon closer inspection to have been no less concerned than the rest.<sup>9</sup> It is the crisis in politics which provides the *Mutterboden* for fundamental speculation upon the nature of man and cosmic order.

The crisis of politics around which Leibniz's thought revolves and which it seeks to resolve is the religious breach and the wars of religion consequent upon it. As he grew up in the Germany devastated by the Thirty Years' War—he was born in 1646—he came to see and appreciate the dependency of all human culture and achievement upon the maintenance of political order. His earliest writings testify to it, and it remains a central theme throughout his later works. Like Grotius and others before him, he was deeply convinced of the unity of what mattered to Christians in the message of the Redeemer. Indeed, he went at one time very far in meeting the Catholic posi-

<sup>8</sup> Cf. the work just cited at end of note 3 and a forthcoming study on philosophy and politics in the series *Erfahrung und Denken*.

<sup>9</sup> Raymond Polin, *Descartes et la philosophie politique*, in *Mélanges Alexandre Koyré* (1965) vol. 1, *l'Aventure de l'esprit*, pp. 381–99.

tion,<sup>10</sup> and his correspondence reverberates with ever-renewed efforts at discovering the common ground between Catholics and Protestants, as did indeed his diplomatic activity extended over many years.<sup>11</sup> To "harmonize" the divergent viewpoints was his great goal.

It is in keeping with this outlook, when Leibniz expounds the vision of an ideal city, the City of God, which is medieval in conception and design. It is a true "theocracy" in which God as benevolent, just, and wise monarch rules over all the spirits—the higher monads who people the world. "All the spirits form together a kind of state under God," we read at one point, and at another: "*Mundus non tantum est machina maxime admirabilis, sed etiam, quatenus constat ex mentibus, est optima respublica.*"<sup>12</sup> But He does not rule without restraint; not His will, but His reason determines this rule. His reason is oriented in terms of an eternal law of nature which binds God more absolutely than it binds man. Before turning to a more detailed exploration of this law of nature, let us remember that this City of God is essentially the same as that envisioned by the great Spanish neo-Thomists, if not by Thomas Aquinas himself. It is a vision which deeply influenced Grotius, whose close student Leibniz had been. It is medieval rationalism in its unitary radicalism. It is indeed part of the *philosophia perennis* which Leibniz acknowledged as his own.<sup>13</sup>

<sup>10</sup> Cf. Leibniz, *Theologisches System*, written presumably in 1683–84, but published only in 1819.

<sup>11</sup> Kuno Fischer, 2 *Geschichte der Neueren Philosophie*, 10ff.; Paul Ritter, *Leibniz und die deutsche Kultur*, 81 *Zeitschrift des Historischen Vereins fuer Niedersachsen*, 165ff. (1916).

<sup>12</sup> "The world is not only a machine which is admirable above all, but, to the extent it consists of minds, is the best *respublica*." *Principes de la nature et de la grace*, para. 15; *Nouveaux essais sur l'entendement humain*, iv, para. 27. Since the monadology has been treated extensively by others, no attempt is made here to elaborate; cf. for a competent review, Herbert Wildon Carr, *Leibniz* (1929), as well as the classic treatment by Ernst Cassirer, *Leibniz' System in seinen wissenschaftlichen Grundlagen* (1902).

<sup>13</sup> Cf. the illuminating preface by Gerhard Krueger to his edition of *Die Hauptwerke* (3rd ed., 1949).

### *The Natural Law.*

Leibniz's natural law doctrine is placed within the general framework of his metaphysics. All ethics, and hence all human society, are seen as expressive of this metaphysically based natural law. The laws of nature and natural law merge, as they did in scholastic thought, determining the life and evolution of all the monads. Each monad reflects the entire world with all the other monads, though in different degrees of clarity and succinctness, whereby a universal harmony of all being is "pre-established." The law of nature is a system of eternal norms toward which the cosmos and its component parts, the monads, are striving; the desire for perfection is inbuilt. The pre-established harmony is a consequence of the reason which permeates the entire world and which is in fact the reason of God. Hence Leibniz can say that the law of nature is based upon the eternal idea of justice and can be derived from it both logically and deductively.<sup>14</sup>

There exists a schema in his early writings for this deductive natural law which recurs with slight variations through a number of later works. In *Nova methodus . . . jurisprudentiae* (1668), Leibniz describes the law of nature as operative on three levels, based upon three principles. First, there is *jus strictum*, governing the state of nature, and oriented toward the principle of *neminem laedere*. Second, we find *aequitas* prevailing in the social state and directed by the principle of *sum cuique tribuere*. Third, there is the level of *pietas*, the higher, religiously determined life which is oriented toward the principle of *honeste vivere*. It is evident that this way of

<sup>14</sup> "Doctrina juris ex earum numero est, quae non ab experimentis, sed definitionibus, nec a sensuum, sed rationis demonstrationibus pendent, et sunt ita dicam juris, non facti." *Akademieausgabe*, VI (1930), p. 460. Cf. also "Causa Dei," an appendix to the *Theodicée*, as given in Schrecker, *op. cit. supra* note 1, at 114ff.

structuring the law of nature is in line with a long tradition of Christian natural law; derived from the basic principles of Roman natural law doctrine, as expounded in the *Institutes*, 1.1, it embodies a summary of Stoic teaching, as everyone knows. Unfortunately, Leibniz does not elaborate what are the consequences of this schema for the philosophy of law. What he has to say seems to stay within the confines of the conventional.

To elucidate, let us briefly speak of his criticism of a highly original contemporary. It would seem that Leibniz's well-known comment on Pufendorf that he is *vir parum jurisconsultus, sed minime philosophus* reveals to some extent his own shortcoming. He was so much opposed to Pufendorf's approach that he could not appreciate the latter's striking originality. Perhaps it is going too far to say that he considered Pufendorf "an imaginative man, second rate, who did what Grotius had left, unphilosophical, a mere clever jurist, without originality, an industrious systematizer and collector of historical facts."<sup>15</sup> The effort to synthesize the teachings of Grotius and Hobbes is as characteristic of Leibniz as of Pufendorf; the difference between the two lies in Leibniz's preference for Grotius, as contrasted with Pufendorf's preference for Hobbes. In Leibniz's *Monita quaedam ad Samuelis Pufendorffii Principia* it becomes very clear that the central objection is a metaphysical one.<sup>16</sup> Leibniz retains the scholastic dimension of speculative philosophy which both Hobbes and Pufendorf radically rejected. Thus in his *Discours de métaphysique* he explicitly acknowledged that he was undertaking "to reinstate the old philosophy"; he did it by reintroducing the "substantial forms"—but a discussion of this problem would lead us too far afield. Suffice it to point out that Leibniz with the above-cited harsh judgment probably wished to say something a bit different from

<sup>15</sup> Erik Wolf, 1 *Grosse Rechtsdenker der Deutschen Geistesgeschichte*, 289 (2nd ed., 1944).

<sup>16</sup> *Monita quaedam ad S. Pufendorffii principia* (1703), in *Opera omnia* (Geneva, 1768), ed. L. Dutens, vol. IV, 3, 275ff.

what a modern is likely to think, if he reads *philosophus* = philosopher. In the days of Leibniz and Newton a *philosophus* was someone who was deeply concerned with the new natural philosophy and more especially its mathematical dimension—and that Pufendorf was assuredly not. For the rest, Pufendorf was an ardent secularist, whereas Leibniz remained attached to the great tradition of the *philosophia perennis*.

After this brief excursion, we can return to a more detailed examination of Leibniz's discussion of the Roman triad. The *jus strictum* appears to be the law of the strictly private sphere, concerned with maintaining peace among equals. It *nascitur ex principio servandi pacis*, but not the public peace; it is simply a prohibition of war and aggression and leaves its addressees otherwise completely free. It is clear that there is an obvious link here to Hobbes and his notion of the operation of the law of nature in the state of nature. On the next level, that of *aequitas*, we are moving into the social state where not merely peace, but happiness, is the end of the law. That is why it can be correlated with the recognition of the other man's welfare: *cunctis prodesse, quantum cuique convenit aut quantum quisque meretur*. These objectives cannot be achieved without allowance being made for communal interests. It is not merely a matter of prohibiting aggression and thus protecting the individual's sphere of activity, but directing positive steps for the promotion of human welfare. These two levels of *jus strictum* and of *aequitas* are, by Leibniz, said also to be the spheres of *justitia commutativa* and *justitia distributiva*, respectively. It would seem that there is no sufficient reason for such an assignment. The familiar doctrine of Aristotle, somewhat distorted by the Latin translation of *diorthotikon* as "commutative"—the meaning being more nearly "corrective"—is here rather arbitrarily further distorted by restricting each branch of justice to one level of jural problems.<sup>17</sup>

<sup>17</sup> Ruck, *op. cit. supra* note 3, at 16–17, gives a somewhat dis-



The highest level of law is that in which *pietas* and *probitas* are the focal point. In the full sense, this level is achieved only in the city of God, and only the universal justice of God can be said to satisfy it. For the principle of *honeste vivere* calls for the pious, really the saintly, life. *Pietas* constitutes the perfection of what was aimed at by the strict law and by equity. As one commentator has rather dramatically put it: "individual advantage and utility become identical with the general welfare so that all that is ethical becomes useful, and all that is useful becomes ethical."<sup>18</sup> It is evident that we are no longer dealing with law in any ordinary understanding, but with its transcendent reflection in a divine justice. No wonder that Leibniz sees natural law in terms of changeless standards of morals which possess the character of eternal truths, as Ernst Cassirer put it.<sup>19</sup> It follows logically that the natural law is not an expression of will, but of reason, as already pointed out. Its norms are not enforced by an outside agency, but are inherent in the divine being. Divine justice is *bonitas conjuncta cum sapientia*. This is the Thomistic vision of a rational God, and hence "*ces lois, ce juge ne contraignent point: ils sont plus forts, car ils persuadent.*"<sup>20</sup> And he adds that wisdom does nothing but show God the best use of His goodness. In the spirit of scholasticism—as indeed of Suarez and Grotius—Leibniz

---

torted summary, due to his inclination to impute to Leibniz the "anticipation" of favored views of his time. The basic statement of Leibniz is found in *Nova methodus docendae discendaeque jurisprudentiae* (1668), II, paras. 72ff. (Dutens, ed., IV, 3, 212ff.); later confirmations in many places, notably *De notionibus juris et justitiae* (1693), and *Monita quaedam ad S. Pufendorfii principia*. Dutens, IV, 3, pp. 275ff.

<sup>18</sup> Ruck, *op. cit. supra* note 3, at 17.

<sup>19</sup> Ernst Cassirer, in his article on Leibniz for the *Encyclopedia of the Social Sciences* (1933); cf. also his magistral study *op. cit. supra* note 12.

<sup>20</sup> "These laws, this judge do not constrain; they are stronger, for they persuade." *Theodicee, Essais sur la bonté de Dieu, la liberté de l'homme, et l'origine du mal*, bk. II, para. 121.

declares that God cannot do what is contrary to reason: ". . . je tiens que Dieu ne saurait agir . . . par une volonté indépendante de motifs raisonnables."<sup>21</sup> This seems reasonable enough if the city of God is envisioned, as it is by Leibniz, as a universal order in which the supreme monad presides over all those monads who as rational souls seek perfection in obedience to His precepts.

### *The Problem of Freedom.*

At this point, the question can no longer be gainsaid: is God, is man free? This question occupies a central place in Leibniz's thought on law and politics. To be sure, Leibniz himself says, at one point in the *Theodicée*, that lawyers and political scientists have little reason to concern themselves with the metaphysical problem of freedom.<sup>22</sup> But actually his views on all three topics of our present inquiry are informed by his metaphysics of freedom, which is itself directly derived from the doctrines of the monad and of pre-established harmony; and indeed these doctrines are presumably at least in part developed by Leibniz, in order to provide for a sphere of freedom in a divinely ordained and predetermined universe. This inner necessity must not be misunderstood as the Stoics and the Mohammedans have misunderstood it, namely as a *Fatum Stoicism* or even as *Fatum Mahumetanum (sic!)*, but must be seen as a *Fatum Christianum* which Leibniz summarizes thus: "Do your duty and be content with what shall come of it . . . because you have to do with a good master."<sup>23</sup> What Leibniz is putting forward is the distinction between two distinct realms as it was later elaborated by Kant. Already in his *Discours de*

<sup>21</sup> "I hold that God cannot act . . . by a will independent of reasonable motives." *Ibid.* at para. 124, and bk. III, para. 283.

<sup>22</sup> Even so, Leibniz demonstrates pretty clearly that he considers the issue relevant, since it turns up in his own strictly legal and political writings, e.g., those given in note 13, *supra*.

<sup>23</sup> *Theodicée*, preface.

*métaphysique* he had explored this issue in application to Julius Caesar; the fact that he crossed the Rubicon and destroyed the republic (Leibniz rightly speaks of a "successful revolution") is capable of being interpreted in terms of Caesar's nature; "Caesar's eventual dictatorship has its basis in his being or nature from which it can be shown that he was to do what he did." But this does not prove that the opposite would contain an inherent contradiction. It is a sequence which God has freely chosen, Leibniz says, because it was the best; and hence "man, though in freedom, will always do that which will turn out to be the best." This kind of truth is accidental, though certain, from which proposition Leibniz concludes that what "leads to rejecting an alternative course of action is not its impossibility, but its imperfection."<sup>24</sup> The only explanation for this kind of human freedom is to be found in what Leibniz calls the spontaneity of rational souls: each monad develops in accordance with this inner spontaneity, this "law of freedom," which propels it toward self-preservation. But how do they achieve coordination with each other and with God? By way of the pre-established harmony which results from the fact that all the monads represent the entire universe, as we said before. There exists within us "a wonderful spontaneity which makes the soul in its resolves independent of the physical influence of all other creatures."<sup>25</sup> Leibniz does not hesitate to see these spontaneous human beings responding to a moral need for perfection, as in a sense God's playthings: "God in a way plays with these little gods whom he has found it good to create." Thus, "Man is there like a little god in his own world, or microcosm, which he governs after his own fashion." Man does wonders, but he also makes big mistakes, because he follows his passions which God has allowed him.<sup>26</sup> These metaphysical speculations

<sup>24</sup> *Discours de métaphysique*, para. 13.

<sup>25</sup> *Theodicée*, bk. I, para. 59. It seems unnecessary to explore further this rather familiar aspect of Leibniz's work.

<sup>26</sup> *Theodicée*, bk. II, para. 147.

are, however, by no means the only thing Leibniz has to say on the subject of freedom. Apart from his preference for a constitutional order of a "government by and with estates" (*Staendestaat*), to which we shall presently return, Leibniz, unlike many of his contemporaries, expressed satisfaction with "German liberty." "Is not the large number of princely courts a wonderful means," he wrote, "by which many people can distinguish themselves who otherwise would have to lie in the dust?" He contrasts this German liberty with the system of absolutism in which "one absolute head" allows but a few to participate in government "by whose grace the rest must live," as he puts it. Nor would he admit that within these German principalities freedom was limited. He feels that it is going too far to say that German liberty affects only a few; for there are many baronial houses, besides the ruling princes, who are only inferior in power, not in freedom. "Where," Leibniz asks, "is the nobility more select or happier than in Germany?" Finally, there are the many free cities, which he feels flourish in trade, credit, good order, and welfare; proudly he cites the opinions of Machiavelli and Boccalini in support of his contention.<sup>27</sup>

### *Patriotism.*

These views are part of Leibniz's general approbation of and indeed advocacy of patriotism. It is a curious political extension of his religious feeling and ardor on behalf of the love of God. He begins one of his pamphlets, primarily devoted to urging Germans to use the German language in science and philosophy—a view in which he probably was reinforced by his sojourns in France and England—by these statements: "It is certain that next to the

<sup>27</sup> *Ermahnung an die Deutschen*, in Leibniz, 1 *Deutsche Schriften* 7 (ed. Walter Schmied-Kowarzik, 1916). The introduction by the editor is a good specimen of nationalist distortion of Leibniz's thought, stimulated, no doubt, by the emotionalism of World War I.

honor of God every virtuous man will mind most the well-being and the glory of his fatherland. . . . The bond of language, customs, yes even that of a common name unites men in a very strong, even though invisible fashion and makes them relatives in a way. . . ." "Hence," Leibniz argues, "the love of one's fatherland is not founded upon the prejudices of simple-minded folk, but on true wisdom, reinforced by the obligation which God and men impose upon us. . . ." <sup>28</sup>

Leibniz was greatly and recurrently concerned with Germany's helplessness in the face of foreign aggression. Thus we read that in his opinion "daily experience" proves that Germany, i.e., the Roman Empire, is by no means as secure and prosperous as it could be and ought to be. After reciting various other sources of weakness, economic, cultural, and moral, all of which he considers serious, but not fatal, he says: "What may destroy our Republic quite suddenly, is a war, either internal or external; for against this we are quite blind, sleepy, wide-open, divided, unarmed, and hence necessarily either the prey of the enemy, or, since we are no match for him by ourselves, the prey of our protector." <sup>29</sup> This could be written today.

It would be a great mistake, though, to understand these sentiments of Leibniz in the sense of a narrow nationalism, as has unfortunately been the case in Germany. <sup>30</sup> For

<sup>28</sup> *Ibid.* at 3.

<sup>29</sup> *Securitas publica* (1670), *Akademieausgabe*, IV, 1, pp.

133-34.

<sup>30</sup> Cf. the introduction cited *supra* note 27, where much is said about Leibniz's "*voelkische Gesinnung*." He is even claimed to be the "*Vater deutscher Weltanschauung und Bildung*," although he surely was a representative as much of *Weltbuergertum* as of *Nationalstaat*, to employ the categories made familiar by Friedrich Meinecke's celebrated study. How simple and indeed primitive Leibniz's patriotic sentiment often manifested itself can be seen from a poem with which Leibniz welcomed a collection of contemporary German poetry and which culminated in the touching lines: "*Was lobt man viel die Griechen? Sie sollen sich verkriechen, Wenn sich die deutsche Muse regt . . .*" (*op. cit. supra* note 27, at 73).

Leibniz, the ardent pluralist, readily combines such love of home and fatherland with a firm belief in the unity of mankind. Indeed, unlike most writers of his time, Leibniz retains a conviction in the viability and utility of the empire. In view of his belief in a City of God this can hardly surprise us. He put this belief perhaps most strongly in the pamphlet dealing with the problem of diplomatic representation of the German princes, *Caesarini Fuerstenerii Tractatus* (1669), where he says flatly that all of Christianity composes one single Republic, and argues that this is by no means paradoxical, but a sound proposition. This single republic has two heads, the pope in spiritual matters, and the German emperor in secular matters; both are vicars of Christ on earth. Leibniz is, however, of the opinion that there should also exist a "permanent council" or at least a senate which the council elects for the periods when it is not sitting.<sup>31</sup> Indeed he goes so far as to express the belief that the decisions of these vicars are enforceable. It is noteworthy, that he should have retained the doctrine of the two swords, as modified by the conciliarist position, in the face of the practical destruction of even the remnants of this system by the Treaty of Westphalia (1648). It was a dream that was slow in dying; only toward the very end of his life did Leibniz completely abandon this notion of a universal order under emperor and pope. Instead, the *respublica* which increasingly occupies his attention is the monarchical modern state, but never as the *Machtstaat* of Hobbes and his followers, but always as the *Rechtsstaat* of the English and German tradition—a constitutional order based upon the pre-eminence of law.

### *Conception of State and Government.*

It is artificial and anachronistic to impute to Leibniz a clear distinction between a political (sociological) and a

<sup>31</sup> *Caesarini Fuerstenerii tractatus de jure suprematus*, ch. XXXI and XXXII, in *Die Werke von Leibniz* (Hanover, 1864-84), ed. O. Klopp, vol. IV, pp. 132ff.

juristic conception of the state. To be sure, in line with his inclination to distinguish between the realm of natural necessity and the realm of spiritual freedom, such a distinction might appear logical. But Leibniz was much too deeply involved in the realities of practical politics and much too aware of the interdependence of the actual operations and legal norms to have considered such a distinction important. For Leibniz the state as a reality of the human dimension is necessarily a part of the world of the spirits that the human monads inhabit.<sup>32</sup> A political community (*civitas*) is "*coetus hominum satis magnus ad spem defensionis mutuae contra vim magnam, qualis metui solet, animo cohabitandi, certa quadam rerum communium administratione constituta, initus.*"<sup>33</sup> Are we entitled to render *civitas* as "state"? Or is it not rather a body of citizens, a city in the ancient sense? Only when the *administratio* is linked with authority under ordinary law, would Leibniz speak of a state (*respublica*); and he immediately introduces the normative dimension, by insisting that it presupposes that action is taken *salutem publicam spectans*, that is to say, with a view to the public good. "Ordinary law" means enforced law, and for the enforcement of law someone in authority must have the right to command (*jus imperandi*), which is the right to coerce and make people do what has been commanded.

<sup>32</sup> The opposite view is set forth with much supporting evidence by Ruck, *op. cit. supra* note 3, at 36ff. For the reasons stated below, his argument remains unconvincing.

<sup>33</sup> "A union of men sufficiently great for hope of mutual defense against great force, such as is customarily feared, with the intention of living together, and constituted with a certain definite administration of common goods." *Caesarini Fuerstenerii*, ch. 10. Ruck cites this passage on p. 37, but fails to note the fact that Leibniz here speaks of *civitas*, rather than *respublica*. This often happens in continental writings, because modern authors in their preoccupation with the concept of the state, speak of both as "state." Note the German term *Gottesstaat* for *Civitas Dei* and related confusions. Cf. my *Transcendent Justice—The Religious Dimension of Constitutionalism*, 11ff. (1964) for more detailed comment on this important point.

In keeping with his general view of law and politics, Leibniz does not, however, accept the doctrine of sovereignty in the Bodinian tradition. Indeed, his difference with Hobbes and Pufendorf is *inter alia* based on his sharp disagreement on this subject. Gierke has rightly pointed out that Leibniz operated with a "relative" concept of sovereignty; that is to say, he basically rejects this concept in its essence which is its indivisibility. Hence Leibniz can speak of multiple sovereignty within a state. At one point Leibniz developed a distinction between *majestas*, *superioritas*, and *supremitas*, but we need not go into this detail.<sup>34</sup> What is decisive for an understanding of Leibniz's theory of government is that he not only accepts but prefers the constitutional state and believes it in fact to be operational. Arguing against Pufendorf, who had described the German empire as a *monstrum*,<sup>35</sup> he points out that there is little sense in first defining sovereignty in an absolute way, and then proceeding to subject all existing orders to abuse; every existing state becomes a *monstrum*, and the only true state is "*ea Respublica, cujus Rex Deus est.*" This discussion is very symptomatic for Leibniz's political philosophy; on the basis of his harmonizing optimism he inclines toward accepting the existing orders as in keeping with the pre-established harmony.

Gierke rightly commented that "Leibniz himself did not attain to any different conception of the "*persona civilis seu moralis Reipublicae*" than others of his time. The unity of the *civitas* is manifest in the ruler: "*Una persona civilis habens summam potestatem in partes suas est civitas*"; and "*una voluntas unitasque personae civilis, qua*

<sup>34</sup> Caesarini Fuerstenerii, Praefatio, chs. 10-12, and 26-33. Cf. also *Specimen demonstrationum politicorum pro Rege Polonorum eligendo* (1669), prop. 16 Dutens, IV, 537, and the interesting comment by Otto von Gierke, *The Development of Political Theory*, p. 220, n. 166 (this is the English version of Gierke's *Johannes Althusius und die Entwicklung der naturrechtlichen Staatstheorien* [1880]).

<sup>35</sup> Severini de Monzambano (S. Pufendorf), *De statu Imperii Germanici ad laelium fratrem liber unus* (Geneva, 1667).



*respublica constat*" is typically found in the ruler who represents all; in him "*persona Reipublicae civilis seu moralis continetur*."<sup>36</sup> All this sounds very much like the political theory of absolutists such as Hobbes and Pufendorf expounded, but Leibniz does not accept these extreme consequences; he retains, as we have shown, the medieval notion of the supremacy of the law. All rulers, including even the divine being, are bound by the rational rules of a universe operating according to a pre-established harmony.

It is consequently possible for Leibniz to accept the notion of a composite state, as did so many of the publicists and jurists of the German empire. In view of this, it is interesting that the great Gierke expressed the opinion that Leibniz came near the conception of the modern federal state; its union differs from a mere confederation, because a "*nova quaedam persona civilis*" is constituted which may be considered a new state (*nova respublica*).<sup>37</sup>

What has been shown so far clearly demonstrates that Leibniz sees the state as a person, as a "rational substance." It is a civil person, a *collegium* which can express a will through a vote or other certain sign. At the same time, such a "person" is characterized by the possession of rights. "*In quem cadit jus et obligatio, ei competit una voluntas. Cui competit una voluntas, is est una persona civilis*."<sup>38</sup> But this *voluntas* is not arbitrary and unrestrained; indeed for Leibniz (as for many medieval thinkers) the *voluntas* must

<sup>36</sup> "A civil person having supreme power in its parts is a *civitas*.—One will and unity of civil person, by which a *respublica* is determined.—The person of the civil or moral *respublica* is contained [in the ruler]." *Caesarini Fuerstenerii*, ch. 11 and the *Codex juris gentium diplomaticum*, Intro., I, para. 22 (1747), as well as *Specimen Demonstrationum Politicarum*, prop. 12. Cf. also Gierke's valuable comment *op. cit. supra* note 34, at 232, fn. 202.

<sup>37</sup> Cf. Gierke, *op. cit. supra* note 34, at 268 and note.

<sup>38</sup> "To whom falls law and obligation, to him belongs a will. To whom belongs a will is a civil person." In *Severinum, Akademieausgabe*, IV, 1, p. 502.

be rational in order to possess binding effect. Hence Leibniz accepts the doctrine of the ephors or estates assemblies as it had developed since Calvin had first enunciated it.<sup>39</sup>

In keeping with the tradition of the *Staendestaat*, Leibniz sees all rulers as parts of the state: "*totum imperium erit Dominus directus feddorum in Imperio*," that is to say, the empire in its entirety is the lord of the feudal powers within it. All rulers are magistrates; they are ministers of the *respublica*, precisely in the sense in which, e.g., a writer like Althusius had interpreted the office.<sup>40</sup>

### *Contractual Theory and Justification.*

Like so many other theorists of his time, Leibniz accepted a contractual conception. It is not a particularly original one, but retains traditional elements in contrast to Hobbes and the Hobbesians. He was quite familiar with the patriarchal doctrine of Filmer as well as Locke's criticism and the latter's own construction. Leibniz's own view closely resembles the Lockean position, but he differs from the latter by his retention of a firm belief in the rationality of man, as contrasted with Locke's notion of the ruling importance of the passions. In keeping with his Grotian propensities, Leibniz stresses man's sociability; even in the state of nature man lives in communities operating in accordance with the strict (primitive) law. Like Locke, he believes that men may and do defend themselves against the violator of this law which is the mani-

<sup>39</sup> Calvin, *Institutes of Christian Religion*, bk. IV, ch. XX, para. 31. Cf. also my *Constitutional Reason of State*, 61ff. (1957). German writers at this point tend to dispute about the problem of *Staatspersoenlichkeit*, Gierke, e.g., denying, Ruck asserting Leibniz's discovery of it. The issue is artificial, and anachronistic. There can be no question that Leibniz recognized a *persona moralis* or *civilis* which might be a *societas*, a *civitas*, or a *respublica*.

<sup>40</sup> Ruck, *op. cit. supra* note 3, at 42-43. These arguments occur in his criticism of Severinus de Monzambano (*op. cit. supra* note 35) as well as in his *Specimen* . . . (*op. cit. supra* note 34).

festation of the law of nature. Yet, the prevailing state was one of peaceful cooperation.<sup>41</sup> Why, then, did a political order arise? Not as a result of crisis, says Leibniz, but by a gradual process of negotiation and adaptation among the various communal groupings. As men develop and come to recognize a set of common interests and a common good, *congruum esse rationi, ut omnia ordinentur secundum maximum bonum commune*. This is the frame of mind in which the value of equity becomes recognized. To this must be added the need of protection against external enemies; we have indicated above that this need was stressed by Leibniz—not surprisingly in view of the continuous invasions of Germany from east and west and the ravages of the Thirty Years' War. It is a theme which Leibniz returns to again and again, both in his correspondence and in his political writings, especially in connection with the dangers resulting from the aggressions of Louis XIV. But the need of political order as a framework for man's self-perfection—in the great Aristotelian tradition—is the primary goal and end of the polity.

Leibniz does not have much to say on the actual process by which the compact comes into being; it appears to him a contractual bond between individuals rather than between groups, as it is in Grotius, Hobbes, Spinoza, and Locke.<sup>42</sup> Yet, unlike some others, Leibniz does not propound the idea of a contract of submission or subjection; the contracting individuals organize themselves, as they do in Althusius, and on the basis of this organization they call upon someone to become legislator or ruler: *populus in legislatorem compromisit*.<sup>43</sup> Quite in keeping with the

<sup>41</sup> *Nouveaux essais sur l'entendement humain*, bk. III, ch. 1; *Monita quaedam ad S. Pufendorfii principia* (Dutens, IV, 3).

<sup>42</sup> Cf. my *Politica Methodice Digesta of Johannes Althusius*, intro. (1932) and the work by Otto von Gierke, referred to above, fn. 34. An interesting chapter is also found in Erik Wolf, *op. cit. supra* note 15.

<sup>43</sup> *Nova Methodus Jurisprudentiae*, II, para. 18 (Dutens, IV, 3, 186).

contemporary trend, as manifest more especially in Bodin and Locke, the emphasis is placed on the legislative function in ruling. For Leibniz, as for Locke, this emphasis is part of the stress they give to a "government of laws and not of men," as the familiar formula puts it. It does not seem necessary to comment at greater length upon this phase of Leibniz's work, even though some interesting details turn up in his arguments against Hobbes and Pufendorf.

### *Leibniz's View of the Common Man.*

Leibniz's recognition of the role of the people and his concern with vindicating their ultimate authority in connection with all political orders must not mislead one into claiming him to have been a democrat. Like Locke, he was a constitutionalist and a believer in the *Rechtsstaat*; he was also a believer in a natural aristocracy of the talented. His stress on the need for an order of rule and command has already been noted; it is part of the order of nature that some men are born with the quality to command, others with that to obey. His elitist propensity leads him to assume, optimistically, that "the first kings are risen to the government over their people by their virtue and their spirit," and that "nature desires that those whom she has given the greatest qualities and who have most virtue should govern the others."<sup>44</sup> But since he combines such thoughts with questioning the acquisition of power and rule by mere convention, his position is not simply traditionalist. On the contrary: "*Le but de la science politique à l'égard de la doctrine des formes des Républiques doit estre de faire fleurir l'Empire de la raison.—Le pouvoir arbitraire est ce qui est directement opposé à l'Empire de la raison.—Ainsi il faudroit penser dans le monde à des loix qui pussent servir à restreindre le pouvoir arbitraire non seulement dans les Rois, mais encor dans les députés des*

<sup>44</sup> Klopp, IV, 461.

*peuples et dans les juges.*"<sup>45</sup> This is the decisive point, and it is impressive that Leibniz should have enunciated this central principle of constitutional government in spite of his low opinion of the common man. In contrast to him the nobility is "formed by a nobler clay"; yet not riches or power or noble descent really makes the difference, but noble gifts.

If therefore one were to ask me what really is the common man, I do not know how to describe him except by saying that he comprises those whose mind is preoccupied with questions about their sustenance, who never rise to the point of imagining what might be the passion to know or spiritual pleasure (*Gemuetslust*) any more than a deaf-born man can judge a marvelous concert. These people are without enthusiasm or excitement; it seems they are made of Adam's earth, but the spirit of life was not blown into them. They live day by day and move on like cattle. . . .<sup>46</sup>

If one takes into account that Leibniz says all this as part of his argument for founding an adult education society, that he insists that the love of letters and the arts may be stimulated even among the lowly, and that it is all part of his concern for raising the level of culture and civilization among his beloved Germans, it becomes possible to appreciate its true political significance. When taken in combination with his praise of the role of the nobility, his conviction about the rule of law as the basis of all sound government, and his abiding hope for a universal order of peace, Leibniz's dislike for the common man is really a dislike for the common in man. He was a glowing opti-

<sup>45</sup> "The end of political science as regards the doctrine of the forms of *respublica* must be to make the empire of reason flourish. Arbitrary power is what is directly opposed to the empire of reason. Thus in the world one must think of laws which can serve to restrain arbitrary power not only in kings, but in deputies of peoples and in judges." Klopp, VIII, 267, 268.

<sup>46</sup> *Deutsche Schriften*, I, p. 10.

mist about the perfectibility of man in this "best of all possible worlds."<sup>47</sup> This optimism shapes his philosophical reflections on law, politics, and government. In none of them was he strikingly original; in all he was more concerned with being right than with being novel. With Goethe he would plead that what was needed was the courage to grasp the ancient truths of the great Christian tradition of natural law and constitutional government: *Das alte Wahre, fass' es an!*

<sup>47</sup> For a discriminating discussion of this much-abused slogan cf. H. W. Carr, *Leibniz*, ch. X (1929).

## THE ROOT OF CONTINGENCY

E. M. CURLEY

Anyone who has more than the most casual interest in Leibniz knows the account given of him in Bertrand Russell's *History of Western Philosophy*: "One of the supreme intellects of all time," but morally rather a questionable character. Possessed of a "profound, coherent . . . and amazingly logical" philosophy, he carefully left it unpublished when he found that the theologian Arnauld was shocked by its Spinozistic implications. The philosophy he did publish, and that by which he became known to his age and to posterity, was another matter—shallow, fantastic, orthodox, dictated by a desire for cheap popularity and the approval of royal patrons.<sup>1</sup> The picture is nearly as persuasive as it is provocative.

But the truth is quite different, and it must be brought out, because it involves fundamental issues in the interpretation of Leibniz's philosophy. What does the principle of sufficient reason mean? How serious was Leibniz's talk of final causes? Did he—could he consistently—accept anything like an orthodox Christian account of the creation? What, ultimately, was his explanation of evil and of

This essay has been written especially for this volume.

<sup>1</sup> Bertrand Russell, *A History of Western Philosophy* (New York: Simon and Schuster, 1945), pp. 581–96. Substantially the same picture is given in the preface Russell wrote in 1937 for the second edition of his *Critical Exposition of the Philosophy of Leibniz* (London: Allen and Unwin) and in his review of Couturat's work (*Mind* 12: 1903, pp. 177–201).

human freedom? There can be no proper answer to any of these questions until the myth of a secret Leibnizian philosophy is laid to rest. No doubt the myth will not have appealed to very many people who know Leibniz well. But the enormous prestige which Russell derived from his classic *Critical Exposition of the Philosophy of Leibniz* has given his later pronouncements an entirely unwarranted influence on the popular understanding of Leibniz. And the myth has just enough substance to it to raise genuine puzzles about Leibniz's meaning, puzzles which need to be solved.

## I

All our reasonings, Leibniz frequently tells us, are based on two great principles:

That of contradiction, in virtue of which we judge false what involves a contradiction and true what is opposed or contradictory to the false, and that of sufficient reason, in virtue of which we consider that no fact can be true or existing and no proposition veritable, unless there is a sufficient reason why it is so, and not otherwise . . . (G, VI, 612; L, 1049).<sup>2</sup>

<sup>2</sup> Page references will be given first to a standard edition of the original text and then to an English translation, wherever one is known to me. The following abbreviations will be used:

G = *Die philosophischen Schriften von Gottfried Wilhelm Leibniz*, ed. by C. I. Gerhardt, 7 vols. (Berlin, 1875-90).  
C = *Opuscules et fragments inédits de Leibniz*, ed. by L. Couturat (Paris, 1903). Grua = G. W. Leibniz: *Textes inédits*, ed. by G. Grua (Paris, 1948). L = *Leibniz: Philosophical Papers and Letters*, ed. by L. E. Loemker (Chicago, 1956). P = *Leibniz: Logical Papers*, ed. by G. H. R. Parkinson (Oxford, 1966). LG = *Leibniz: Discourse on Metaphysics*, ed. by P. G. Lucas and L. Grint (Manchester, 1961). M = *The Leibniz-Arnould Correspondence*, ed. by H. T. Mason (Manchester, 1967). Langley = *New Essays Concerning the Human Understanding* by G. W. Leibniz, ed. by A. G. Langley (New York, 1896). SG = *From Descartes to Locke*, ed. by T. V. Smith and M. Grene (Chicago, 1957).

I shall, however, generally make my own translations.



Closely associated with these two principles is the distinction between necessary truths, or truths of reason, which are held to be true in virtue of the principle of contradiction, and contingent truths, or truths of fact, which are held to be true in virtue of the principle of sufficient reason.

Now the principle of contradiction is comparatively unproblematic. It is worth mentioning that Leibniz frequently interprets it as involving not only what we would call the principle of contradiction (i.e., not both  $p$  and not- $p$ ), but also what we would call the principle of the excluded middle (i.e., either  $p$  or not- $p$ ).<sup>3</sup> But there is little doubt about what he means by the principle. And it is also uncontroversial, I think, that every proposition whose denial involves a contradiction is necessary, though there has been a good deal of controversy as to whether *only* a proposition whose denial involves a contradiction is necessary.

The meaning of the principle of sufficient reason, however, has been very much in doubt. And on some of the interpretations it has been given, there is grave doubt as to whether Leibniz could really allow that there are any contingent propositions at all. Hence the danger of Spinozism.

The trouble arises in the following way. The great contribution which Russell and Couturat made to our understanding of Leibniz lay in their emphasis on the importance of certain logical doctrines for his philosophy as a whole. In particular they maintained that the leading propositions of Leibniz's metaphysics—the denial of causal interaction between substances, the principle of the identity of indiscernibles, the doctrine that bodies are not substances, and that true substances are not extended—all these and many other characteristic Leibnizian views are derived from his account of the nature of truth. Russell's excitement at this discovery is vividly conveyed in the Preface to the first edition of his *Critical Exposition*:

<sup>3</sup> E.g., G, V, 343; Langley, 405.

Suddenly a flood of light was thrown on all the inmost recesses of Leibniz's philosophical edifice. I saw how its foundations were laid, and how its superstructure rose out of them. It appeared that this seemingly fantastic system could be deduced from a few simple premises, which, but for the conclusions which Leibniz had drawn from them, many, if not most, philosophers would have been willing to admit (p. xiv).

The principal source of this illumination—for Russell, at any rate—was the *Discourse on Metaphysics*, with its doctrine that all true propositions are either explicitly or implicitly identity statements, i.e., either explicitly of the form "A is A" or "AB is A," or else capable of being reduced to that form by an analysis of the terms.<sup>4</sup>

But Russell, in the *Critical Exposition*, was not prepared to take quite strictly the view that all truths are, as we should now say, analytic. After all, unless the ontological argument is to apply to everything that exists, we must make some exceptions. The proposition that God exists, no doubt, is analytic—if we analyze the notion of God, we will find that his perfection entails existence—but other existential truths are synthetic. Russell was not able to adduce any very direct evidence for making this exception. But it was indirectly supported by a number of passages, for example:

As for eternal truths, it is necessary to observe that fundamentally they are all conditional and say, in effect, given a thing of this sort, a thing of that sort is. E.g., to say "Every figure which has three sides also has three angles" is to say nothing but "If there is a figure with three sides, that same figure will have three angles" (G, V, 428; Langley, 498).

It is necessary to philosophize differently about the

<sup>4</sup> See particularly sections 8–15 (G, IV, 432–41; LG, 12–27) which closely parallel the most dramatic piece of evidence for what we may call the "logicist" interpretation of Leibniz, viz., the short paper "First Truths." C, 518–23; L, 411–17.

notion of an individual substance than about the specific notion of a sphere. The notion of a sphere involves only eternal or necessary truths: but the notion of an individual involves, *sub ratione possibilitatis*, what is of fact, or what is related to the existence of things and to time. Consequently it depends on some free decrees of God considered as possible, for truths of fact or of existence depend on the decrees of God (G, II, 39; M, 41).

Neither of these passages speaks specifically of the status of existential propositions, but it seems clear that necessary truths carry no commitment to the existence of anything, whereas contingent propositions are related in some special way to existence and time.

If we say that existential propositions (save "God exists") are synthetic, then there does seem to be room for a doctrine of creation, in spite of the fact that all non-existential predicates which are ever true of any individuals are contained in the notion of those individuals. That Adam would sin was eternally part of his nature. So if God creates Adam, he creates a sinner. But that Adam should exist is not part of his nature, and so there is a role for God's decrees. He must decide whether or not to render actual this possible individual, whose nature is in every other respect completely determined, even down to his relations with all other individuals. To decree the existence of Adam, rather than some other possible individual, is not merely to bring into existence a creature whose entire life story is foreknown to God, but to create a whole world with an equally determinate future. Still, God does have a choice about Adam's existence. Leibniz certainly talks this way sometimes,<sup>5</sup> and such talk certainly seems to imply that most existential truths are synthetic.

If this is correct—if propositions asserting the existence of finite substances are synthetic and if the existence of the substances that do exist is due to God's choice, then apparently the fundamental reason why this world exists

<sup>5</sup> E.g., G, IV, 454-57; LG, 48-54.

rather than some other lies in the will of God. God foresaw that this world, with all its limitations, would be the best of all possible worlds, that its defects would, in one way or another, be made up. And so Russell concluded that the principle of sufficient reason amounted to an assertion of the existence of final causes.<sup>6</sup>

## II

Such, with considerable simplifications, were Russell's views before Couturat. But the *Critical Exposition* was closely followed by *La Logique de Leibniz*, and Russell soon concluded that he had been wrong.

First of all, Couturat, relying partly on previously unpublished manuscripts, was able to cite quite a number of passages in which Leibniz states very emphatically that his account of truth holds for *all* true propositions, necessary or contingent.<sup>7</sup> And indeed, if it is a general doctrine about the nature of truth, and if existence is, as the ontological argument requires, a predicate, it is difficult to see what would justify making any exceptions, however awkward it might be not to. To make existence a predicate whose affirmation is (nearly) always synthetic is to confound Leibniz with Kant.<sup>8</sup> Existence, according to Leibniz, is nothing but an *exigentia essentiae*—a claim or demand of essence (G, VII, 195). As such it is contained in all essences.

This doctrine is a particularly difficult one, but perhaps the clearest exposition of it comes in a short paper entitled *On the Radical Origination of Things* (G, VII, 302–8; L, 789–98; see also Grua, 285–87). There Leibniz

<sup>6</sup> *Critical Exposition*, p. 34.

<sup>7</sup> E.g., C, 518–19; L, 412; Foucher de Careil, *Nouvelles lettres et opuscules inédits de Leibniz* (Paris, 1857), p. 179; L, 405; G, II, 52, 56; M, 58, 63.

<sup>8</sup> L. Couturat, "Sur la métaphysique de Leibniz," *Revue de Métaphysique et de Morale*, 10 (1902), p. 12.

says that, in order to understand how temporal, contingent truths arise from eternal or essential ones, we must first recognize, from the very fact that something exists rather than nothing,

. . . that there is in possible things, or in possibility or essence itself, some exigency of existence, or so to speak, a reaching out [*praetensionem*] for existence, or in a word, that essence of itself tends toward existence. Whence it follows that all possibles, i.e., things expressing essence or possible reality, tend by equal right toward existence, according to the quantity of essence or reality, or the degree of perfection which they involve (G, VII, 303; L, 791).<sup>9</sup>

But though all possibles tend toward existence, not all can be jointly realized—some are logically incompatible with others. So of the infinitely many different combinations of “compossibles,” that one exists through which the most essence or possibility is brought into existence. And indeed, in one place Leibniz *defines* the existent as “that which is compatible with more things than any other which is incompatible with it” (C, 360; P, 51; cf. C, 530).

As Russell remarks, if this is intended as a definition in the strict sense, then

strange consequences follow. . . . For, if it was so intended, there was no act of creation: the relations of essences are among eternal truths, and it is a problem in pure logic to construct that world which contains the greatest number of coexisting essences. This world, it would follow, exists by definition. . . .<sup>10</sup>

And so the Leibnizian system—or at least that system as expounded by Couturat and followed to its logical consequences—leads directly to a necessitarian doctrine to which God’s purposes have little relevance; it leads, in short, to a form of that dread disease Spinozism, though a form

<sup>9</sup> Accepting Loemker’s emendation of the text.

<sup>10</sup> *Critical Exposition*, pp. vi–vii.

modified perhaps by the qualification that not all possibles exist.<sup>11</sup>

There is a further difficulty raised by Couturat against Russell, viz., that judgments of existence are not the only contingent propositions. The laws of nature are also contingent, and for the same reason as existential judgments, viz., that they involve an infinite analysis.<sup>12</sup>

Here Couturat focuses on an aspect of Leibniz's doctrine which Russell had rather tended to play down. In a number of places, Leibniz places great stress on the fact that the analysis of a contingent proposition involves an infinite process, with the result that it cannot be completed by the finite human intellect. Hence, we can never know, *a priori*, that Peter will deny Jesus, though God, of course, can. A characteristic passage is the following:

I believe that I have unravelled something secret, which has long perplexed me. For I did not understand how the predicate could be in the subject, and nevertheless the proposition not be made necessary. But the knowledge of geometry and the analysis of infinities kindled this light for me, so that I understood that even notions can be resolved to infinity (C, 18; SG, 308).<sup>13</sup>

The analysis of a necessary truth is like the comparison of two numbers which have a common factor. A finite process will show that the smaller number is "present in" the larger one. But the analysis of a contingent truth is like the comparison of incommensurables. No finite process will show that the smaller number is contained in the larger.

The analogy is likely to strike a modern reader as un-

<sup>11</sup> In point of fact, Spinoza thinks that all possibles do exist, but only in a rather special sense. So the opposition between him and Leibniz is not so great as Leibniz generally tries to make us believe.

<sup>12</sup> Couturat, "Sur la métaphysique de Leibniz," p. 13.

<sup>13</sup> Cf. Foucher de Careil, pp. 178-85; L, 404-10; C, 388-89; P, 77-78.

fortunate in its suggestion that the difference between necessary and contingent truths exists only for finite intellects. But Leibniz seems to have been more concerned that it might not adequately rule out *a priori* knowledge by man of contingent truths. In the *Generales Inquisitiones*, after remarking that the difference between necessary and contingent truths is the same as that between intersecting lines and asymptotes, or commensurable and incommensurable numbers, Leibniz points out that

there is a difficulty standing in our way. We can demonstrate that one line constantly approaches another, although not intersecting it, and that two quantities are equal, even in asymptotes, by showing what will be the case however far the progression is continued. And so men will be able to attain certainty about contingent truths (C, 388; P, 77-78).

As Couturat remarks, the objection is a natural one for the discoverer of the infinitesimal calculus. But Leibniz seems to have decided that this was just one respect in which the analogy between surd roots and contingency was not perfect. In contingent truths the created mind cannot even know on what limit the analysis converges (C, 18; SG, 307-8).

There is, I think, some difficulty in applying this talk of infinite processes to laws. It is not at all clear why Leibniz should think that laws of nature, like singular propositions, require an infinite analysis for their *a priori* proof. In the case of propositions like "Peter denied Jesus," a reason is readily available. For Leibniz holds that every singular substance involves the whole universe in its perfect concept (C, 521; L, 414). And he seems to regard it as essential to an individual concept, as opposed to a general one, that it include the individual's relations with all other individuals (G, II, 39, 49; M, 41-42, 54-55). Otherwise it will not be complete and will not suffice to distinguish its subject.<sup>14</sup> But since laws, like necessary truths,

<sup>14</sup> Whether or not this can be reconciled with Leibniz's teach-

characteristically involve only purely general predicates, it is not evident that they should require an infinite analysis.

Nevertheless, Leibniz clearly thought that laws do require an infinite analysis (C, 19-20; SG, 309-10), that they are contingent (C, 19; SG, 309), and that these two facts are connected.

But in addition to the awkwardness of making an exception to the "predicate-in-notion" principle for predications of existence, and the uncertain position of laws of nature, there is a further obstacle to an approach to Leibniz like that of the early Russell. And that is the interpretation given by Couturat to the principle of sufficient reason. For Couturat adduces a considerable body of evidence to show that this great principle requires a purely logical interpretation, that in its most accurate formulation it is simply the principle that all truths are analytic, and that it is, therefore, the converse of the principle of contradiction, according to which all analytic propositions are true.<sup>15</sup> The more familiar version of the principle—that nothing happens without a sufficient reason why it should be so rather than otherwise—is only a formula borrowed from common sense, and it is, strictly, a consequence of the principle, rather than the principle itself. Properly

---

ings about relations, I do not know. It seems to me that N. Rescher is probably right in holding (against Russell) that, for Leibniz, relations are not "unreal," but merely reducible to non-relational predicates; see *The Philosophy of Leibniz*, Prentice-Hall, 1967, ch. 6. On the danger of a vicious regress in the analysis of individual concepts, see my *Spinoza's Metaphysics*, Harvard University Press, 1969, ch. 3. The danger of this regress may have provided a motive for the doctrine of reducibility. Unless relational predicates were reducible to non-relational ones, even God could not see the analysis of an individual concept. But the whole matter still seems to me to be terribly obscure. [For discussions of this matter, see the essays in this volume by Hintikka and Ishiguro.—HGF.]

<sup>15</sup> See Couturat, *La Logique de Leibniz*, Paris, 1901, pp. 214-16. The principal passages are: G, II, 56; M, 63-64; C, 519; L, 413; G, VII, 309; G, VII, 199-200.



formulated, the principle contains nothing to suggest that it reduces to the assertion of final causes.

### III

Now what are we to make of all this? Russell, faced with Couturat's evidence, but mindful of the passages on which his own interpretation had been based, concluded that Leibniz had deliberately misled us as to his real views. After all, he had tried them out on Arnauld, who was sent an abstract of the *Discourse on Metaphysics*, and the result was hardly encouraging. Arnauld wrote back that he found

in these thoughts so many things which alarm me and which almost all men, if I am not mistaken, will find so shocking, that I do not see of what use a writing can be, which apparently all the world will reject (G, II, 15; M, 9).<sup>16</sup>

Arnauld called attention particularly to the proposition that the individual notion of each person involves once and for all everything that will ever happen to him. The *Discourse* was never published and Russell concludes that Leibniz subsequently adopted "a policy of secrecy as to his real thoughts on philosophical subjects." The writings that were published are dismissed as mere pious popularizations of a system which is fundamentally most unorthodox.

It would not, in a way, be too surprising if this were so. The seventeenth century, beginning as it did with the burning of Bruno, was not an age in which men could feel entirely secure in the expression of heterodox views, and some suspicion arises about the sincerity of most of the major philosophers of the period. It is well known that Descartes suppressed his Copernican treatise *Le Monde* when he learned of Galileo's difficulties with the Inquisi-

<sup>16</sup> Quoted by Russell, *History*, p. 591. I have given Russell's rendering.

tion and that in his later writings on astronomy he was careful to elaborate a theory of motion according to which the earth does not move. Spinoza's eloquent plea for freedom of expression, the *Theological-Political Treatise*, in spite of containing a number of apparent concessions to Christian sensibilities, had to be published anonymously, with the place of publication falsely given as Hamburg. The *Ethics* could only be published posthumously. The sincerity of Hobbes's characterization of the laws of nature as commands of God has been the subject of much controversy and it is perhaps only in our own century that very many have taken seriously the notion that Hobbes might not have been an atheist. With Locke, the question arises whether or not he was, as theological critics claimed, a Socinian. His most recent biographer thinks he certainly was, his vigorous denials notwithstanding.

Nevertheless, I find the notion of a secret philosophy, as applied to Leibniz, implausible. It is one thing to make passing concessions to orthodoxy and quite another to write a *Theodicy*. No one could compose a work so long and so dull without a very strong conviction of the truth and the importance of what he was saying. Leibniz's remark in a letter to Placcius—"He who knows me only by my published writings does not know me"—is often quoted, and there can be no doubt that this is true. But if we may judge by the works which have come to light in this century (I have in mind here not only those published by Couturat, but also those published by Grua and Jagodinsky<sup>17</sup>), the importance of these works is not that they show a different system, but that they add detail and logical structure to the system already seen in Leibniz's pop-

<sup>17</sup> See Grua, *op. cit.*, and Jagodinsky, *Leibnitiana elementa Philosophiae arcanae de summa rerum*, Kasan, 1913. Selections from this work are included in Loemker, pp. 243-56. In 1915 Jagodinsky edited Leibniz's early dialogue, *Confessio Philosophi*, but this is now more readily available in the editions of Belaval (Paris, J. Vrin, 1961, with a French translation) and Saame (Frankfurt-am-Main, Vittorio Blosterman, 1967, a critical edition with a German translation).

ular works. The overwhelming impression one receives from reading them is of the continuity of Leibniz's philosophy, not of any sharp division.

But these are very general remarks. To see just how wrong Russell is, we need to take a close look at the correspondence with Arnauld. For in point of fact, Russell has grossly distorted the history of that most important exchange.

It is true, of course, that Arnauld's initial reaction to Leibniz's ideas was one of horror. But we need to remember that his initial reaction was based, not on a reading of the *Discourse on Metaphysics*—it is not clear that Arnauld ever did receive the *Discourse*—but on a reading of an abstract of the *Discourse*, an abstract which makes no mention of the doctrine that all truths are analytic. The thesis to which Arnauld took exception was that the individual notion of each person involves all that will ever happen to him. And I think one may fairly ask whether this doctrine is fundamentally any more shocking than that which Leibniz published with great fanfare in the 1690s. I refer, of course, to the "hypothesis" of a pre-established harmony, according to which God gives to each substance, from the first,

a nature or internal force which . . . produces in it, in order (as in a spiritual or formal automaton, but free in that which has a share of reason) all that will happen to it . . . (G, IV, 485; L, 748).

Indeed the distinction between what Arnauld found shocking and what Leibniz subsequently published is a fine one.

Leibniz did not, of course, publish the *Discourse*. Nor did he, so far as I know, publish any other work in which the doctrine of the analyticity of all truths was asserted. But he did frequently express an intention of publishing the correspondence with Arnauld.<sup>18</sup> And there was no reason why he should not publish it. From his point of

<sup>18</sup> On this see Dr. Parkinson's introduction to Mason's edition of the correspondence, pp. xiii-xiv.

view it had a very successful conclusion—or at least that part did which touched on the problem of contingency. For Arnauld ultimately pronounced himself satisfied with the way Leibniz explained the difficulties he had raised on that point (G, II, 63–64; M, 77). Curiously, the argument which seems to have done the most to reassure Arnauld was Leibniz's invocation, comparatively late in that part of the correspondence, of his "predicate-in-notion" principle:

I was particularly struck by this reason, that in every true affirmative proposition, necessary or contingent, universal or singular, the notion of the attribute is comprehended in some way in that of the subject: *praedicatum inest subjecto*.

It is little wonder that Leibniz subsequently regarded the exchange as a triumph. As he writes at the beginning of the *New System*:

Some years ago I conceived this system and communicated it to certain learned men, and particularly to one of the greatest theologians and philosophers of our time. Having learned some of my opinions from a person of the highest rank, he had found them very paradoxical. But when he received my explanations, he retracted in the most generous and edifying way possible . . . (G, IV, 477; L, 740).

Leibniz never did publish the correspondence. But then there are so many works Leibniz never published that this should hardly be surprising. He was a chronic non-publisher, even of works which could give no rise to suspicions of unorthodoxy, such as his lengthy criticisms of Descartes and Locke. The reasons for not publishing tend to vary from one work to another. With the *Animadversions on the General Part of Descartes's Principles*, one factor seems to have been the all-too-familiar difficulty of finding a publisher (G, II, 271–72). As for the *New Essays Concerning the Human Understanding*, Leibniz appears to have lost interest in that project after Locke's

death (G, V, 9). In the case of the correspondence with Arnauld, the explanation is probably nothing more sinister than distraction by other interests.

#### IV

If we reject the notion of a secret doctrine—as I think it is clear we must—we are still left with the problem of reconciling in some way the apparently contradictory tendencies of Leibniz's thought. Of course it is always possible that Leibniz was simply confused and incoherent. So few people attain perfect consistency in their thinking that it would not be very remarkable if Leibniz had failed. But it is, nonetheless, a sound maxim of interpretation that confusions and inconsistencies are not to be postulated unnecessarily, particularly where the topic is one of central importance for a major philosopher. And so we have a problem.

We may begin by pointing out that the Russell of 1900 was quite right to make existence an exception to the "predicate-in-notion" principle. So far as I have been able to discover, the reservation is not made explicitly in any of the works Russell relied on for his *Critical Exposition*. Negative existential propositions about what is in Leibniz are always dangerous, so I make this remark tentatively. But Russell's instincts about what Leibniz would say were surely sound. The reservation is made in works published subsequently, as when Leibniz writes that

the possibility or notion of a created mind does not involve existence (C, 23),

or that

all truths about contingents, i.e., about the existence of things, depend on the principle of perfection. All existences, the existence of God alone excepted, are contingent. But the reason why one contingent thing exists, rather than others, is not sought from its defini-

tion alone, but from comparison with other things. For since there are infinitely many possibles which nevertheless do not exist, the reason why these exist rather than those must not be sought from the definition (otherwise, not to exist would imply a contradiction, and the others would not be possible, contrary to the hypothesis), but from an extrinsic principle, which is that these are more perfect than the others (Grua, 288).<sup>19</sup>

So we must reject Couturat's contention that an exception to the "predicate-in-notion" principle is nowhere indicated.<sup>20</sup>

But it is one thing to say that Leibniz makes an exception for existence, and another to say that such an exception is justifiable in his system. Does the special position accorded to existence not anticipate Kant's claim that existence is not a predicate? Can Leibniz consistently maintain the ontological argument? In 1900 Russell thought not, remarking that "it must be regarded as a sheer inconsequence, in Leibniz, that he failed to apply his doctrine to God" (p. 27). This criticism is based not only on the consideration that Russell's initial interpretation gives existence a unique status among predicates, but also on the fact that in at least one place Leibniz seems to anticipate an argument of Kant's against the view that existence is a predicate:

If existence were something other than an exigency of essence, it would follow that it has a certain essence or adds something new to things, concerning

<sup>19</sup> See also Grua, 302-3. The argument in this passage is strikingly like an argument of Spinoza's designed to show that there cannot be more than one substance of the same nature; see *Ethics* I, p. 852 and cf. Leibniz's comment (G, I, 143-44). It is worth pointing out, however, that Leibniz's conclusion is quite un-Spinozistic and that the assumption that there are infinitely many non-existent possibles was regarded by Leibniz as being one of the key points of difference between himself and Spinoza; cf. C, 529-30.

<sup>20</sup> "Sur la métaphysique de Leibniz," p. 13, n. 1.

which it could be asked in turn whether this essence exists, and why it rather than another (G, VII, 195n).<sup>21</sup>

But if existence is not a predicate, then the ontological argument fails. Against this may be placed remarks such as the following:

Existence is conceived by us as if it were a thing having nothing in common with essence, which nevertheless cannot be the case, because there must be more in the concept of the existent than in that of the non-existent, i.e., existence is a perfection, since there is really nothing else explicable in existence than that it enters into the most perfect series of things (C, 9).

This not only seems to make existence a predicate; it also suggested to Russell that "the existent," for Leibniz, is definable as "that which belongs to the best possible world."<sup>22</sup> It was by passages such as this that Russell was persuaded that Leibniz did regard existence as a predicate and true existential propositions as analytic. Hence, he concluded, Leibniz's system was fundamentally incompatible with orthodox views about the creation and with most of Leibniz's own published work.

The whole question of existence seems to me a very difficult one. I think there is some reason to suppose that Leibniz himself may not have been quite sure what he wished to say about it. It is worth noting that the frequently quoted passage beginning "If existence were something other than an exigency of essence . . ." occurs as a marginal note, and that in two other passages in which Leibniz says or implies that existence does not "add something new to things," he subsequently deleted those re-

<sup>21</sup> Cf. Kant, *Critique of Pure Reason*, A598-600.

<sup>22</sup> Cf. the passage already cited from the *Generales Inquisitiones*, where the existent is defined as that which is compatible with more things than any other which is incompatible with it (C, 360; P, 51).

marks (cf. Grua, 303, 304). This suggests that Leibniz may have been in some uncertainty about what he thought, or how to express what he thought.

On the other hand, the passage beginning "Existence is conceived by us . . ." does not—if taken in its context—strike me as incompatible with the former passage. It occurs, interestingly, as part of a comparison of existence with position and runs as follows:

Just as existence is conceived by us as if it were a thing having nothing in common with essence, which nevertheless cannot be the case, because there must be more in the concept of the existent than in that of the non-existent, i.e., existence is a perfection, since there is really nothing else explicable in existence than that it enters into the most perfect series of things; so in the same way we conceive position as something extrinsic, which adds nothing to the thing placed, though it does nevertheless add the way in which the thing is affected by other things (C, 9).

In this passage, too, Leibniz implies that existence does not "add something new" to the thing that exists, or at least that we naturally think of existence in this way. But to say this, for Leibniz, is not to make the Kantian claim that existence is not a predicate; it is to say that existence is an extrinsic denomination. And when he says that there must be more in the concept of the existent than in the concept of the non-existent, he is making his usual point about extrinsic denominations—none of them are purely so, there must always be some basis in the nature of the thing for its existence.

So existence, like the goodness of some twentieth-century moral philosophers,<sup>23</sup> is a "supervenient" or "consequential" characteristic, a property that a thing has in vir-

<sup>23</sup> E.g., R. M. Hare, *The Language of Morals*, Oxford University Press, 1964, section 5.2–5.3. Cf. R. Routley, "Some Things Do Not Exist," *Notre Dame Journal of Formal Logic*, 7: 251–76 (1966).



tue of other properties that it has, or as a consequence of having those properties. This, I think, is why Leibniz frequently expresses himself on this point by saying that existence does not add something *new*. The difference between what exists and what does not exist is not like the difference between a signed painting and an unsigned painting, but like the difference between a good painting and a bad one. Things which differ in respect of existence cannot differ only in that respect, there must be some further difference on which that difference is based.

This view seems to come out most clearly in a short work "On Contingency," which has been published by M. Grua. After remarking that God's existence does not differ from his essence, whereas that of creatures does, Leibniz goes on to say that

nevertheless, because we say that both God and creatures exist, and that necessary no less than contingent propositions are true, there must be some common notion of contingent existence and essential truth.

In my opinion, what is common to all truth is that a reason can always be given for a proposition which is not an identity, a reason necessitating in necessary truths and inclining in contingent ones.

[And since existence does not add a new form to essence, otherwise essence] What seems to be common to existents, both necessary and contingent, is this, that they have more reason than the other things which might be put in their place (Grua, 303).

And a bit further on,

[This is certain, that what exists does not receive a new form by existing] This is certain, in every truth there is a connection between the predicate and the subject. Hence, when it is said that "Adam a sinner exists," there must be something in this possible notion, Adam a sinner, on account of which he is said to exist (G, 304).

The bracketed phrases, I should point out, are ones which Leibniz decided not to leave standing; and the final word in the first bracketed phrase is in the accusative case.

But though I have spoken of existence as a "consequential" characteristic, and though Leibniz himself says that "essence or possibility must contain something from which actual existence follows" (Grua, 17), I do not think it was really Leibniz's position that existence could be strictly defined in terms of any of those characteristics from which existence is said to follow. It is true, of course, that in the *Generales Inquisitiones* Leibniz does suggest a definition of the existent as "that which is compatible with more things than any other which is incompatible with it" (C, 360; P, 51). But again, the context is all-important. Leibniz is there giving a list of primitive simple terms, i.e., of terms which are either unanalyzable or taken to be so (C, 358; P, 49). When he comes to "the existent," he remarks parenthetically that a cause of existence can nevertheless be given and that existence *could* be defined in the way suggested. "Still, we refrain from these things now as being too profound." The tone of the whole passage is very tentative.

When Leibniz does return to the topic (C, 375-76; P, 65-66), he begins by saying that he does not see what is conceived in the existent except "some degree of entity," i.e., of possibility, and he goes on to paraphrase his earlier definition by saying that the existent is what is compatible with the most things, or the most possible entity. But then he switches to what looks like an entirely different train of thought, though he says it comes to the same thing. For there follows a series of four definitions in which the key notions are psychological. In order, they are:

- (i) The existent is that which pleases something intelligent and powerful.
- (ii) The existent is that which would please some mind and would not displease another more powerful mind, if any minds whatever are assumed to exist.

- (iii) The existent is what would not displease the most powerful mind, if the most powerful mind is assumed to exist.
- (iv) The existent is what pleases some mind, and does not absolutely displease the most powerful mind.

The second of these is preferred to the first because it does not presuppose the existence of something. The third is apparently regarded as equivalent to the second. And the fourth is favored over them all, on the ground that a definition is needed which is applicable to experience. The fourth, like the second and third, is to be read as not having existential import.

So we have a rather embarrassing profusion of definitions, even within one work. If we go outside that work, we can find others.<sup>24</sup> As I have suggested above, however, I do not think any of these is to be taken very seriously as a definition. After all, Leibniz does say pretty explicitly that the existent cannot be defined in such a way as to give us a clearer notion of it (Grua, 325), and most of his ventures into defining the indefinable are qualified by some such phrase as "nothing other than this is conceived or explicable in the existent." What he takes himself to be doing, I think, is probably best described as assigning a cause for existence.

And it is here, I think, that the duality of his definitions is suggestive. It will not do simply to define the existent as what is pleasing to God, because there must be some reason why just that and nothing else is pleasing to him, some objective difference between this world and the rest which provides a ground for his choice. God's taste in worlds is discriminating.

But neither will it do to define the existent simply in

<sup>24</sup> E.g., "The existent is such a state of the universe as is pleasing to God" (C, 405); see also C, 9; Grua, 325. Leibniz's earliest "definitions" of existence, on the other hand, have a distinctly phenomenalist flavor; cf. Y. Belaval, *Leibniz critique de Descartes*, Paris: Gallimard, 1960, p. 484, n. 4.

terms of that characteristic which distinguishes it from the other, non-existent possibles. For the most possible entity, or best of all possible worlds, is not self-realizing. Russell has sometimes written as though it were. Thus in his 1903 review of Couturat:

Essences range themselves in the conflict on the side of those with which they are compossible and a tug of war results in which the majority are victorious. An interesting conflict of ghosts all hoping to become real! But it is hard to see what God has to do in that *galère* (p. 186).

This, however, involves an interpretation of the doctrine which Leibniz explicitly rejects. If there were some power in possibles by which they could actualize themselves, then the set of compossibles which involves the most essence would necessarily carry the day. But possibles, precisely because they are possible and not actual, have no such power. Therefore we must seek the cause of their existence in the choice of an already existent necessary being (Grua, 286). It is only as ideas in the mind of God that possibles can be said to have any existence.

If the argument of the foregoing pages is correct, then what is called for is not merely a repudiation of the myth of a secret Leibnizian doctrine, but also a return to something like Russell's original interpretation of Leibniz in the *Critical Exposition*. True existential propositions are an exception to the general run of true propositions, in that all but one of them are strictly synthetic. This does not, however, mean that existence is not a predicate. It is an extrinsic denomination, but not one which is wholly extrinsic. There is always some basis in the nature of the thing for the correct predication of existence, a basis which consists of the fact that the thing enters into the best possible world. Still, existence does not follow from that fact *simpliciter*. It follows only given the further fact that God chooses to create the best possible world. So in the end the

principle of sufficient reason does involve essentially the assertion of final causes.

I do not wish to maintain that this way of understanding Leibniz is entirely without difficulties. But some of the difficulties raised against it can, I think, be overcome. E.g., Couturat has suggested that one problem is that Leibniz regards not only existential propositions, but the laws of nature too, as contingent. The reply to this is simply that, according to Leibniz, the laws of nature are also existential propositions, so that they do not form a distinct class of contingent truths:

These laws are not necessary and essential but contingent and existential. . . . For since it is contingent and depends on the free decree of God that the series of things exists, the laws of the series will also be contingent (C, 20; SG, 310).

The contrast drawn here between essential and existential propositions is explained in the *Generales Inquisitiones*. If we consult that work, we shall be able to understand the otherwise rather surprising doctrine that the laws of nature are existential propositions. There Leibniz considers the four categorical propositions of classical logic, which he says can be reduced from their standard form, described by Leibniz as *tertii adjecti*, to a form he calls *secundi adjecti*:

<i>tertii adjecti</i>	<i>secundi adjecti</i>
All A is B	A not-B is not a thing
Some A is B	AB is a thing
No A is B	AB is not a thing
Some A is not B	A not-B is a thing.

The reduction is apt to make modern readers think of the interpretation given the categorical propositions in Boolean algebra, or modern quantification theory, with "is a thing" playing a role analogous to that of " $\neq 0$ " or the existential quantifier. But the comparison is misleading. For Leibniz makes it plain that the phrase "is a thing" is subject to

two possible readings—"is an actual thing" or "is a possible thing."<sup>25</sup> If it is given the latter reading, the proposition is essential; if the former, the proposition is existential. So, "all circles are plane figures," which is given as an example of an essential proposition, says that a circle which is not a plane figure is not a possible thing. But a law of nature, such as "unsupported bodies fall to the earth," says only that an unsupported body which does not fall to the earth is not an actual thing, i.e., does not exist.

This will also help to explain something else that was puzzling earlier, viz., the fact that laws are regarded by Leibniz as involving an infinite analysis. For all existential propositions involve a reference to some determinate time (C, 529),<sup>26</sup> and all propositions into which existence and time enter involve the whole series of things (C, 19). For the here and the now cannot be understood except by relation to the rest.

But problems still remain. Leibniz clearly attached great importance to the fact that contingent propositions involve an infinite analysis, and he seems to have thought that their contingency in some way depended on the fact that their *a priori* proof was impossible for a finite intellect. At present I can see no reason for this at all. It appears to be a mistake. As Russell pointed out in 1903, truths about unactualized possible individuals, *qua* pos-

<sup>25</sup> So a closer analogue would be the unorthodox system of quantification proposed by R. Routley, *op. cit.*, where the variables are permitted to range over possible as well as actual entities, the "existential" quantifier is interpreted non-existentially, and existence is treated explicitly as a predicate.

This approach to propositions may have been suggested to Leibniz by John of St. Thomas. Cf., e.g., Leibniz's approach to the problem of conversion *per accidens* (in "Some Logical Difficulties," G, VII, 211-17) with that of John, as recounted by A. Church, "The History of the Question of Existential Import of Categorical Propositions," in *Logic, Methodology and Philosophy of Science*, ed. by Y. Bar-Hillel, North-Holland Publishing Co., Amsterdam, 1965.

<sup>26</sup> A reflection, perhaps, of John's distinction between natural and accidental supposition. Cf. Church, *op. cit.*

sible, involve an infinite analysis just as much as do truths about actual individuals. Yet the former are necessary, the latter contingent. So involving an infinite analysis does not appear to be a sufficient condition of contingency. How Leibniz could have thought it was remains a mystery.

It is worth mentioning, however, that infinite processes seem to occur in Leibniz's philosophy in a variety of ways, and that their relevance to the problem of contingency may be greater in some of these ways than in others. E.g., consider the proposition "Adam is a sinner," taken as an essential proposition, i.e., as a proposition which is to be understood as asserting that "Adam a sinner is a possible thing."

The concept of Adam, if it is to be an individual concept, i.e., if it is to secure uniqueness of reference to a *possible* individual, must be a complete concept, in the sense that it must assign one or the other of each pair of contradictory predicates to the subject.<sup>27</sup> And if it is a complete concept, then the question of the truth or falsity of any predication about that possible individual must be purely a question of logic. So the analytic theory of truth may be said to arise from the necessary conditions for making true predications about non-existent individuals<sup>28</sup> (cf. G, II, 54-56). But just because the con-

<sup>27</sup> Hence Leibniz's answer to Professor W. V. O. Quine's rhetorical queries (*From a Logical Point of View*, Harvard, 1953, p. 4) about the possible bald man in the doorway and the possible fat man in the doorway is, I think, that we cannot say that an *individual* has been referred to until a complete concept has been specified. Once this has been done, we (or rather God) can decide whether or not the two possible men are the same, by seeing whether or not they have the same individual concept.

<sup>28</sup> Strictly speaking, what arises from considerations about making true predications of non-existent possible individuals is only the application of the analytic theory of truth to singular propositions. But the theory that all general truths are true by definition had already been announced by Hobbes (cf. *Leviathan*, chs. 4, 5), and this seems to have been one aspect of Hobbes' theory of truth with which Leibniz had no quarrel (cf. G, VII, 190-94). I think Hobbes is a much more likely source of this

cept of any possible individual is a complete concept, its analysis involves infinities. So the question of logic cannot be answered *a priori* by any finite logician. That is one way in which infinite processes occur, and it seems to me completely irrelevant to the problem of contingency. Leibniz would not wish to claim that the proposition in question is contingent.

It is different if we consider the proposition existentially, i.e., as asserting that "Adam a sinner exists." Existence is not part of the concept of any possible individual save God. But there is always some basis in the individual concept for any true predication about the individual, always *some* connection between the subject and the predicate. In the case of true existential propositions, the connection is that the individual expresses in its concept that possible world which contains the most reality. Nevertheless, that it does this is not to be learned from the analysis of the concept of the individual alone. "Even if someone could know the whole series of the universe, he would still not be able to give a reason for it, except by undertaking a comparison of it with all other possible worlds" (C, 19; SG, 309). And since there are infinitely many possible worlds, this would involve another, quite distinct infinite process.

Here again, it is not easy to see what this has to do with contingency. That this world is the best possible world is presumably a necessary fact, which is not rendered any the less necessary by the number of other possible worlds be-

---

view than Arnauld, who has sometimes been suggested. See Loemker, "A Note on the Origin and Problem of Leibniz's Discourse of 1686," *Journal of the History of Ideas*, 8: 449-66 (1947).

Reflection on the problems of making unique reference to possible individuals also helps to explain why existence is an exceptional predicate. If a complete concept is a necessary condition for making true predications about non-existent *possible* individuals, then their non-existence must be excluded from their concept. Otherwise, they will not even be possible. Cf. the passage cited from Grua, 288, on pp. 83-84 of this paper.



ing infinite rather than finite. If the existence of this world does follow from its being the best possible world, then its existence is equally necessary.

But, of course, the existence of this world does not follow simply from its being the best possible world, but from that together with God's decision to create the best possible world. As Leibniz says in one place, this proposition, that God wills to choose the most perfect, is "the first principle concerning existence . . . the first of all propositions of fact, i.e., the origin of all contingent existence" (Grua, 301).

Now there is one great difficulty in any explanation of Leibniz which makes the contingency of truths of fact rest in the end on their being a consequence of God's decision to create the world. This will work only if it can be plausibly maintained that God's choice was contingent. In 1900 Russell thought it could not.

We can hardly suppose that, in other possible worlds, God would not have been good, or that it is a merely contingent fact that God is good. But if we were to make this supposition, we should merely remove the difficulty one stage further, since we should then require a sufficient reason for God's goodness. If this reason were necessary, God's goodness would also be necessary; if contingent, it would itself require a sufficient reason, concerning which the same difficulty would recur (p. 39n).

This is a very real dilemma. If anything follows from God's being a supremely perfect being, his goodness should. And yet I think it clear that Leibniz would want to maintain that in some possible worlds God would not have been good—e.g., in one in which the innocent were tortured eternally in hell and the wicked rewarded in heaven.

If God's goodness is contingent, this does lead to the infinite regress which Russell says threatens. But in at least one place, Leibniz seems not only to accept this regress, but to insist on it:

If anyone asks me why God has decided to create Adam, I say, because he has decided to do the most perfect thing. If you ask me now why he has decided to do the most perfect thing, or why he wills the most perfect . . . I reply that he has willed it freely, i.e., because he willed to. So he willed because he willed to will, and so on to infinity . . . (Grua, 302).

This may sound like a Rylean parody of the doctrine of the will, but Leibniz appears to think that the performance of this infinite series of acts of will offers no difficulties for God, however impossible it might be for man. Whether or not this is a defensible view, it is the only one of the various ways in which Leibniz invokes infinite processes which seems to me to have any bearing on the problem of contingency.

I said earlier that, in addition to difficulties about the status of existential propositions and laws of nature, Russell's initial criticism of Leibniz involved the awkwardness of Leibniz's frequently putting the principle of sufficient reason in such a way as to make it equivalent to the principle that all truths are analytic. From what has been said now, I think it is clear that we cannot accept these formulations of the principle as reflecting Leibniz's most accurate statement of his views. "I cannot always explain myself fully," writes Leibniz,

. . . but I always try to speak accurately. I begin as a philosopher, but I end as a theologian. One of my great principles is that nothing happens without reason. That is a principle of philosophy. Nevertheless, at bottom it is nothing but an affirmation of the divine wisdom, though I do not speak of this at first.<sup>29</sup>

<sup>29</sup> Eduard Bodemann, *Die Leibniz-Handschriften der Königl. öffentlichen Bibliothek zu Hannover*, Hildesheim, Georg Olms, 1966, p. 58. I am indebted for this reference to M. Belaval, *op. cit.*, pp. 459, 535.

Russell's early interpretation in the *Critical Exposition*, though based on less evidence than his later discussions, is still the soundest guide to Leibniz's thought on the principle of sufficient reason and the problem of contingency.



# MONADOLOGY

MONTGOMERY FURTH

I should like to discuss some issues of contemporary philosophical relevance that are raised by Leibniz's theory of monads.<sup>1</sup> My purpose is both historical and philosophical; it is historical in the sense that I set out a theory as to how Leibniz responded to the Cartesian mind-body problem and how he proposed to resolve it, but it is chiefly philosophical, in that what I (perhaps wrongly) take to

From *The Philosophical Review*, vol. 76 (1967). Reprinted by permission of the author and the editors of *The Philosophical Review*.

<sup>1</sup> For later reference, I give here the abbreviations of titles cited frequently in the paper. C. Adam and P. Tannery (eds.), *Œuvres de Descartes* (Paris, 1897-1913) is cited as AT; and C. I. Gerhardt (ed.), *Die Philosophischen Schriften von G. W. Leibniz* (Berlin, 1875-90) is cited as G. Although the translations given are my own throughout, I generally specify locations of passages in some standard English edition. Among these are E. Anscombe and P. Geach (eds.), *Descartes: Philosophical Writings* (Edinburgh, 1954), containing the best existing English translations of Descartes, upon which I have relied heavily, cited as AG; E. S. Haldane and G. R. T. Ross (eds.), *The Philosophical Works of Descartes* (Cambridge, 1931), cited as HR; L. E. Loemker (ed.), *G. W. Leibniz: Philosophical Papers and Letters* (Chicago, 1956), cited as L; G. R. Montgomery (ed.), *Leibniz: Discourse on Metaphysics et al.* (La Salle, Ill., 1947), cited as M; G. M. Duncan (ed.), *The Philosophical Works of Leibniz* (New Haven, Conn., 1890), cited as D; and the Appendix of extracts from Leibniz in B. Russell, *The Philosophy of Leibniz*, 2nd ed. (London, 1937), cited as R.

have been his analysis of the difficulty seems to me to contain several remarkable insights, worth exploring on their own account, as well as leading to interesting difficulties of their own. I should stress also that from a historical viewpoint my account is highly idealized, on at least three counts. First, I consider only Leibniz's reaction to Descartes, and pay hardly any attention to the many other influences upon him. Second, regarding his relation to Descartes, I consider only the mind-body problem and closely related matters, ignoring, for example, Leibniz's critique of Cartesian dynamics, which certainly is connected closely with his monadism. And third, regarding the mind-body problem, I concentrate on a particular line of attack that is to be found in his writings, particularly later writings, without troubling much over the fact that at various times Leibniz held various other views, and that many of his statements of the view that interests me are not completely clear or else conflate it with others. However, although the strand I shall be tracing is narrow and sometimes twisted, I think there is no question that it is to be found in his thought, and worth following out on historical as well as philosophical grounds.

In the first of the following sections I contrast Leibniz's concept of monad in a preliminary way with Descartes's notion of *res cogitans*. In Section 2, I give an interpretation of the first few pages of Descartes's Second Meditation that differs from some now current, in order to show that several of the seeming Leibnizian innovations set out in Section 1 actually have their origins in Cartesian principles, although Descartes himself does not exploit them and indeed helps himself to others less natural; evidence is presented that Leibniz put a similar construction on these pages. Section 3 returns to Leibniz's own theory, explains the principle of Harmony among the multitude of monads, and argues that the theory as thus far unfolded should be regarded as phenomenalistic in nature, directly comparable with proposals made in recent years to "reduce" statements that assert the obtaining of actual states of affairs

in the "external world" to statements concerning actual or possible (in this case, exclusively actual) mental events; the comparison seems by no means unfavorable to Leibniz's version. In Section 4, finally, we consider the idea of the monads' being differentiated from one another by their "point of view."

# 1. What a Monad Is: Preliminary

We can obtain the idea of a monad from that of a Cartesian *res cogitans*, conscious being, by making three interconnected changes in the latter notion. (1) We begin by withdrawing the stipulation that an event occurring in a *res cogitans* must be *consciously* experienced, or that a *res cogitans*' being in a certain state is necessarily its being consciously aware of something (that the *esse* of such a state or event is *cogitari*). Leibniz offers both direct arguments<sup>2</sup> and various examples—spinning cogwheels, the sound of the surf, and so forth—intended to demonstrate that unconscious perceptions occur; without ruling on their effectiveness in establishing that conclusion, we can take the examples as introducing us to a comprehensible *idea*. We also understand "being conscious of" as admitting of degrees.<sup>3</sup>

This allowance of unconsciously experienced perceptions renders it easier for us next (2) to understand a monad (as we may as well begin calling it) as a mind aware of a certain world, or to which a certain universe is "objectively" presented,<sup>4</sup> but a mind which typically is explicitly con-

<sup>2</sup> For a short summary see Russell, *The Philosophy of Leibniz*, pp. 156 f.

<sup>3</sup> Like Leibniz, I take "(relatively) minute perception" as synonymous with "(relatively) unconscious perception," and I take "confused perception" to mean the same as "perception such that not all of its parts are separately consciously perceived." Cf. Russell, *op. cit.*, p. 157, and Sec. 4 below.

<sup>4</sup> When "objective" (etc.) appears in quotes, as above in the text, I mean it to have its older, fourteenth-to-eighteenth-century sense, that which it bears, e.g., in Descartes's Third Med-

scious of (or "apperceives") only a minute fraction of this presented universe or even none of it. In the case of the monad that is *myself* (to which my expertise<sup>5</sup> is for the present confined), among my conscious perceptions at this moment is a perception which I may describe for the reader's benefit, in makeshift translation from that private language in which I express these thoughts to myself, as follows: it is a *cogitatio* as it were from the sense of sight (*tanquam a sensu visionis*) of the upper surface of a desk upon which it is to me as if a hand is writing in pencil.<sup>5</sup> Among my unconscious perceptions are perceptions of the interior of the desk, of a floor beyond it, and of the interior of a massive planet beyond that; others are of a wall behind me, and of sky and space beyond that. To put it in full: a gigantic physical universe—including an entire past and future as well as present<sup>6</sup>—is immediately present in the experience of the monad that is *myself*; of this, a tiny select group of surfaces and aspects over a short span of time is currently being lit up by my relatively con-

---

itation. I use it without quotes in its modern meaning, in which it is opposed to "subjective," as in the writings of Frege or C. I. Lewis.

<sup>5</sup> Cf. Descartes's Second Meditation, AT, VII, 28, 29 (AG, 70, 71), and other occurrences of the "*tanquam*" idiom at AT, VII, 39, 87, 88 (AG, 80, 122, 123). The idiom is important; it is by its use that Descartes conveys in the *Meditations* his construal of sensations as a species of *cogitatio*, of conscious event, not requiring for their occurrence the existence of sense organs, or even of a body. When he describes a *cogitatio* as *tanquam a sensibus*, he is not telling us "where it comes from," but trying to evoke heuristically in us a feeling for what *kind* of *cogitatio* it is. (*Cogitationes* are discussed further in Sec. 2.)

<sup>6</sup> But I shall ignore this aspect of the matter for the most part, except to remark here that I have so far failed to understand "appetition" in monads—introduced by Leibniz as if co-ordinate with "perception"—as capable of being anything but confused perception of future states; hence (it seems) will and understanding are as thoroughly fused in a monad as they are in Spinoza's *Deus sive Natura*. To pursue this would take us too far from our present concern.



scious awareness of them. How it is to other monads I postpone considering.

It is important to understand that when I speak of a monad as "aware of a certain world," "having a certain universe present to it," or the like, I mean to be giving a qualitative description of that monad, in a sense from which it cannot be inferred that there exists a world of which the monad is aware—unless this means, simply, exists for the monad (in which case it would be better put differently). Thus the world of a monad is, in a phrase of Miss Anscombe's,<sup>7</sup> an "intentional" object of the monad's conscious or unconscious awareness. Hence for a monad, as for a Cartesian ego of the Second Meditation, there is no incompatibility between (on the one hand) its being to that monad as if things were thus-and-so, and (on the other) things not being thus-and-so—perhaps, for that matter, nothing else existing at all. To mark this point, I shall often use Leibniz's evocative phrase of a monad's "expressing" a certain world: a usage that lends itself less readily to the misconstruction I wish to avoid. (Leibniz normally adds that each monad "expresses" a certain world "from a certain point of view"; we shall consider this in Section 4.)

Finally (3), consonant with the above, we retain the Cartesian practice of regarding the experiences of a mind as its qualities ("modifications"), and of according to a mind itself the logical status of object ("substance"). But in addition we explicitly adopt the view that an object is individuated by its qualities, so that—combining these attitudes—what differentiates a given monad from any other is the particular set of experiences, conscious and unconscious, that go to make it up; distinct monads must differ in point of some feature of their perceptions. This is to apply the Principle of Identity of Indiscernibles to

<sup>7</sup> G. E. M. Anscombe, "The Intentionality of Sensation: A Grammatical Feature," in Butler (ed.), *Analytical Philosophy*, Second Series (Oxford, 1965). This essay also describes the shift in the use of "objective" noticed above (n. 4).

the case of monads as objects; no reconstruction of Leibniz's theory could do otherwise. We also adopt the converse, that qualitative entails numerical distinctness, the Indiscernibility of Identicals.

All three of these departures from the Cartesian concept of a *res cogitans* are without doubt major. To me and (I believe) to Leibniz, they nevertheless are not so great as to prevent us from seeing, embedded in the notion of *monad* that results from them, a Cartesian nucleus. In particular, the second and third departures even seem to me to be germinally present in the Second Meditation, though they are not what Descartes goes on to develop; and there is evidence that Leibniz, too, read the Second Meditation in this way. Since we confront here a very sensitive issue of interpretation of Descartes, discussion of which will also help to motivate what follows, it is worthwhile to digress and explain.

## 2. Cartesian Digression

As readers of the *Meditations* well know, Descartes gives the impression at the beginning of the Second Meditation that the methods of the First have reduced him, or his protagonist, to a state of "doubt" with regard to every proposition whatever. This is supposed to have come about because the First Meditation has laid down a method such that, for any proposition that the protagonist is inclined to assert, a case can be constructed in which exactly the same conditions held as now incline the protagonist to assert it, where yet the proposition was itself false. The key lies in what is taken for "conditions"; and we learn what conditions Descartes has in mind from his handling of the proposition, for example, *I am sitting by the fire*. Here what unsettles me from my former uncritical acceptance is the reflection that I might be inclined by experiences exactly similar (*a similibus ekiam cogitationibus*) to those I am now undergoing, to assent to it when it was not true: if homespun examples are wanted, when I was in bed,

asleep and dreaming. (It does not appear to be particularly important that the possibility imagined is dreaming as opposed to something else, such as waking hallucination.) Thus the technique of the First Meditation is to ask, with respect to each proposition  $\Phi$  that I am inclined responsibly to assert ("responsibly" eliminates frivolity and lying): (1) What is it in my current internal state (what group of *cogitationes* is it, at present occurring in me) that prompts my assertion of  $\Phi$ ? (2) Is the occurrence in me of all this, to which I am now adverting, incompatible with  $\Phi$ 's being in fact false? If the protagonist, in the light of the best answer he can give to (1), cannot answer affirmatively to (2), then for him  $\Phi$  is "doubtful," not to be believed, whatever his inclinations. This is the test that *I am sitting by the fire* fails to pass, for everything could be to me exactly as it now is in the sense of my answer to (1), where the proposition was in fact false. Indeed, no type of proposition whatever that is considered in the First Meditation passes this test; and so the protagonist's doubt is represented as universal. In this way the entrance of the argument *cogito ergo sum* in the Second Meditation is rendered the more spectacular for ostensibly occurring on a bare stage, for ostensibly affording (in the phrase of the *Principles*) "the first knowledge that we obtain, *ordine philosophando*," the first step in the retrograde movement of retrieving selected propositions as "certain."

But while it is true that the first proposition actually argued to be immune from the methods of the First Meditation is *sum*, it is not true that these methods are sufficient to sweep the stage entirely clear for its entrance and enthronement; to the contrary, on Descartes's own principles one is in a position to assert a considerable number of propositions at the very outset of the Second Meditation with absolute certainty—to wit, propositions reporting one's currently occurring *cogitationes* themselves, including *cogitationes* of the kind called "*tanquam* from the senses." The real net effect of the First Meditation, to which the effort at doubting functions as a means, is to

work the protagonist down to asking and answering for himself questions like (1), adverting inward and focusing on his *cogitationes* in the peculiar way required, and accepting that his complete answer to (1) with respect to a given proposition  $\Phi$  is (at this point, anyway) the totality of his grounds for assenting to  $\Phi$ ; any statement of grounds for  $\Phi$  in a more ordinary sense of "grounds" ("there is a footprint/a watch here in the sand"), which is not already in the form of an answer to (1), must itself be subjected to questions (1) and (2), and thus is no better off than was  $\Phi$ . But my description, call it  $\Psi$ , of my current internal state itself (that is, of currently occurring *cogitationes*, *tanquam*-sensory included) is another matter; for my answer to (1) with respect to  $\Psi$  is identical with  $\Psi$ , and hence the answer to (2) must be affirmative. Thus propositions of this kind survive the First Meditation; nor does Descartes suggest elsewhere any way of calling them in question. So the following, for example, although taken from the middle of the Second Meditation, is in all essentials well within the protagonist's reach at the beginning, before performing the argument from *cogito*:

It is I who am having sensations, or animadverting to corporeal objects as it were [*tanquam*] by the senses: viz., I am now seeing light, hearing a noise, feeling heat. These objects are unreal, for I am asleep; but at least I seem to see, to hear, to be warmed. This cannot be unreal; and this is what is properly called my sensation [or: sensing (*sentire*)]; further, sensation [*sentire*], precisely so regarded, is nothing but an act of consciousness [*cogitare*].<sup>8</sup>

This passage, too, is relevant:

By the term "conscious event" [*cogitationis nomine*] I understand everything that takes place within ourselves so that we are aware of it, insofar as it is an object of our awareness. And so not only acts of understanding, of will, of imagination, but even of sensa-

<sup>8</sup> Second Meditation, AT, VII, 29; cf. AG, p. 71.

tion [*sentire*], are here to be taken as conscious events [*cogitare*]. Suppose I say: *I see* (or *I am walking*) *therefore I exist*. If I take this to refer to a seeing (or walking) that is done by the body, then the conclusion is not absolutely certain; for, as often happens during sleep, I may think I am seeing though I do not open my eyes (or think I am walking though I do not change my place); and it may even be that that I have *no* body. But if I take it to refer to the very sense or awareness itself of [*de ipso sensu sive conscientia*] the seeing (or walking), then it is quite certain; for in that case it has regard to the mind, and it is the mind alone that has a sense or conscious experience of [*sentit sive cogitat*] itself seeing (or walking).<sup>9</sup>

Thus for Descartes, despite the appearance generated by the drama, not only do a great many propositions survive the First Meditation, but the survivors cover a highly varied range of events: “*everything* that takes place within ourselves so that we are aware of it,” including all sensory experience that is “objectively” of external things, so long as this is construed as “animadverting to corporeal objects as it were [*tanquam*] by the senses.” It is true that Descartes has some trouble in formulating these propositions for his reader, having to resort to gesticulations like “the very sense or awareness itself of”; this is because he is endeavoring to formulate in publicly intelligible terms something that each reader can locate only within himself. On that understanding, however, a small, ill-assorted and ill-put sample of propositions about which I (speaking for Descartes) can be quite certain, before or without performing the argument from *cogito*, is: *I seem to see, to*

<sup>9</sup> *Principles of Philosophy*, I, 9; AT, VIII, 7 f.; cf. AG, p. 183. The same example is used in the Reply to the Fifth Objections, AT, VII, 352; cf. HR, II, 207. And see also Addendum to the Reply to the Second Objections, AT, VII, 160; cf. HR, II, 52. In neither of the latter cases should the HR translation be relied on.

hear, to be warmed. I am animadverting to corporeal objects as it were by the senses; for example, it is to me as if I were seated by a fire, wearing a winter cloak, holding a piece of paper. I will that this hand (that I seem to see and feel) move forward, and it is to me as if it does so. It is to me (by memory and imagination) as if I were in winter quarters. And so on, and on.

My situation at the end of the First Meditation is then this: although, for all I know, whatever things I see are illusions; none of what my memory represents to have happened really did so; I have no sense organs; body, shape, extension, motion, place are chimaeras, and so forth,<sup>10</sup> nonetheless there is a great deal going on about which I am in no doubt, and which makes up, in a legitimate manner of speaking, a world—the world of a Cartesian ego or, briefly, a Cartesian world, that which (speaking as such an ego) is “objectively” presented in my experience, or which my conscious awareness is (“intentionally”) awareness of. It is, so to speak, a highly discontinuous world; and I should identify it with the consciously perceived fragment of a fractionally awake monad—like that *myself* the notion of which I was entertaining before the present digression.

It is also worth noting that the use of the first-person pronoun (“I seem to see”; “it is to *me* as if”) in our sample description above, intended to suggest my interior monologue, is quite dispensable and ought theoretically to be dispensed with. It is suggestive in the makeshift public translation, as evoking the flavor of an individual mind reporting how it is to him; but *within* that mind, the basic form is not “it is to me as if  $\Phi$ ,” but simply “it is as if  $\Phi$ .” The point of course is not new; and many readers of the Second Meditation have remarked—normally, to deplore—Descartes’s tendency to assume without argument that he can legitimately continue to use the word “I” (and the like) in a referring capacity, as if to distinguish himself

<sup>10</sup> Second Meditation, AT, VII, 24; cf. AG, p. 66.

from others, in its Second Meditation setting.<sup>11</sup> But it is equally important that a Cartesian ego simply is not in a position to discriminate between *himself* and *his world*; they cannot at this point be distinguished (distinguishing them at any point is no small task), and from this standpoint the importation of the first-person pronoun into the interior description of a Cartesian world can do the disservice of suggesting a subject-object division that is not present in the original. If it does not do that, it adds nothing.<sup>12</sup>

These points bear closely both on the status of the argument *cogito ergo sum* and on the way in which the Cartesian program goes progressively to pieces in the course of subsequent Meditations. First, we see that there really are two forms of the argument from *cogito*. One, the more famous and Descartes's apparent favorite, turns upon taking as the conscious event referred to by "*cogito*" the act of my doubting my own existence in the strong sense of attempting to suppose that I do not exist. Thus the argument is of the form *I suppose that I do not exist, therefore I exist* (another form is *The evil genius deceives me as to my existence, therefore I exist*), and hangs on the peculiarly self-stultifying character of the *cogitatio* in question.<sup>13</sup> But we see that for Descartes this is not the only

<sup>11</sup> Thus Lichtenberg is supposed to have observed that where Descartes asserts, "I am thinking," he ought to say rather, "there is thought (*es denkt*)"; for an unusually crisp rendering of the point, see Geach, *Mental Acts* (London, 1957), p. 118.

<sup>12</sup> Cf. Wittgenstein, *Tractatus Logico-Philosophicus*, 5.621, 5.63 ("I am my world"); and Carnap, *Der Logische Aufbau der Welt* (Berlin, 1928), pp. 87-90 ("*Das Gegebene ist subjektlos*"). Carnap quotes an apothegm: "*dass, wenn gedacht wird, es etwas geben muss, das denkt, ist einfach eine Formulierung unserer grammatischen Gewöhnung, welche zu einem Tun einen Täter setzt*"; his source is not Wittgenstein, or Lichtenberg, but Nietzsche.

<sup>13</sup> This side of the argument is most recently studied by Hintikka in "*Cogito Ergo Sum: Inference or Performance?*," *Philosophical Review*, LXXI (1962), 3-32. He makes use of a notion that he calls "existential inconsistency," applied to state-

*cogitatio* that will generate a verbally identical argument for "my" existence: a *cogitatio* of walking, or of seeing, or any *cogitatio* at all, will do. Nor is this second form of the argument from *cogito* absent from the Second Meditation itself, toward whose close we find such specimens as: *I see (= I think I see) wax, therefore I exist; I judge that wax exists from the fact that I touch (= think I touch, presumably) this wax, therefore I exist; I judge that wax exists from the fact that I imagine it (or for any other reason), therefore I exist*; <sup>14</sup> and we are told that the same holds for all external things—meaning, naturally, all "objectively" presented ones, the world of real external objects being still under sentence of doubt.

Now, the situation at this point is so delicate, and the language at hand so clumsy, that any description of the position at which we have arrived is likely to be wrong, or wrongly taken. Further, awareness that a given description is wrong is not the same as being able to locate the problem accurately, or to do better. With due diffidence on both counts, then, I suggest that Descartes makes two serious mistakes in attempting to depict the present situation. First, he concludes that the argument from *cogito* can succeed at this point in isolating and demonstrating the existence of an ego or self, a certain *object* ("substance") bearing the name "I," specifiable not as any part of the "Cartesian world" of the protagonist's experience, but as a distinct subject that is beholding it. And second, he bestows upon this supposed object an analysis that renders it a "substance" in the sense of a *substrate* for its modifications, which are the *cogitationes* already familiar. The result is the conception of *res cogitans* that we find through the remainder of the Meditations: the strange idea of an underlying core of sentient individuality, a somewhat in which *cogitationes* occur. The situation then deteriorates

---

ments (such as "I do not exist"); but I mean "self-stultifying" to be a predicate of a conscious act (such as doubting my own existence).

<sup>14</sup> Second Meditation, AT, VII, 33; cf. AG, p. 74.



rapidly, for thenceforward it is on this understanding of the term that he asks: how am I, a *res cogitans*, related to the realm of extended beings that its qualities, my *cogitationes*, purport to disclose, and particularly to the extended being "my" body?<sup>15</sup> He is unable to answer this question, and by the Sixth Meditation is entangled in hopeless difficulties over what conceivable connection can hold between a stomach's being in a certain state and a *res cogitans* experiencing a *cogitatio* of desire for food, or between the occurrence in a *res cogitans* of a certain *cogitatio* of will and the motion of an arm; by then he is fighting, not for "certainty," but for his sanity. The final outcome is a disorderly retreat: we in effect abandon the notion of *res cogitans* entirely, by abruptly ceasing to count sensations as a straightforward species of *cogitatio*, and instead placing them in a special category of events that occur in a mind (whatever that may now be) due to its standing to a certain extended being, a human body, in a special relation called "being united to and as it were mixed up with."<sup>16</sup> We also commence reading "myself" simply as "a whole, who am made up of both body and mind." In this way the distinctive insights of the First and Second Meditations are compromised, and the task of finding what reconstruction or approximation of our conceptual scheme relating to mind and body is possible in terms of them is abandoned altogether. (Leibniz remarked that Descartes seemed thereafter to have simply "given up the struggle" on the problem.<sup>17</sup>)

I do not claim that this unhappy issue is brought about solely by the pair of questionable moves I have cited, but

<sup>15</sup> It is best to pass over the matter of the *existence* of extended beings, simply making him a present of them; as Leibniz remarked, "the argument he employs is weak, and it would have been better not to try" ("Animadversions on the General Part of Descartes's *Principles*," II, 1; G, IV, 366; cf. L, p. 644; D, p. 58).

<sup>16</sup> Sixth Meditation, AT, VII, 81; cf. AG, p. 117.

<sup>17</sup> "New System of the Nature and Communication of Substances," G, IV, 483; cf. L, p. 746; D, p. 76.

I believe that they contribute substantially to the eventual collapse, by suggesting the understanding of *res cogitans* that is at least partially responsible.<sup>18</sup> Nor am I able to lay down in any very definite and uncompromising way exactly how Descartes ought, on his own principles, to have proceeded instead; at best I can point in a direction, and that not well. We have seen that as early as the end of the First Meditation the protagonist can be certain, on Cartesian principles, of a great deal more than Descartes at that point explicitly gives him credit for, and this "objectively" presented current totality that remains subsequent to the First Meditation we have called a Cartesian world. We have also observed that the use of the first-person pronoun in imagining the protagonist's description of that world, however naturally it may come to us, is at best superfluous; on this point, indeed, we appear to have considerable company. But now I put myself in the protagonist's position, and consider matters from there. And it seems to me, in doing so, that not only is the totality present that is *this* Cartesian world: it is *all* that is present; there is nothing further. If I ask, "But what am I?," the only response open to me at this point seems to be either to reject the question as deriving from a mistaken conception of the role of the first-person pronoun in the interior description, or else to identify *myself* with *this world*, in its way a rejection of the question also. And so I conjecture that the conception of self to which Descartes's methods actually entitle him is not the conception of what *he* comes to call *res cogitans*, the ill-starred notion of underlying sentient ego, but is indistinguishable from that of a Cartesian world itself—which in turn, as already noticed, is not unlike the consciously perceived portion of a partially

<sup>18</sup> Another culprit is undoubtedly Descartes's unquestioning assumption, antecedent to all study and philosophy, that the question how I move my arm equals the question how I *cause* my arm to move, and that the question how I am sensorily aware of a real extended object equals the question how the object *causes* such-and-such a *cogitatio* to occur in me.

conscious monad. He is shunted off this track by a variety of factors: he assumes from the start that "I" functions in the same way in the protagonist's soliloquy as it does in ordinary public discourse; this has the effect of tending to concentrate our attention on the self-stultifying form of the argument from *cogito*, to the exclusion of the multitude of other equally legitimate cases of it;<sup>19</sup> and this in turn encourages the impression of the proposition *sum's* being established as it were in a vacuum (the bare-stage reading of the argument), thus finally tempting us into interpreting the conclusion as: the object *myself* exists, even if nothing else does. Whereas in fact, the conclusion could equally well (or badly) be stated: the entirety of this Cartesian world exists, its *esse* being *cogitari*, even if nothing else does (and a complicated affair it is).<sup>20</sup>

There is some reason to believe that part at least of this depiction of the discrepancy between the conception of *res cogitans* to which (I claim) Descartes's principles naturally lead, and the conception which usurps its place in

<sup>19</sup> The very fact that the argument from *cogito* is such as to validate the conclusion *sum* no matter what *cogitatio* is taken as starting point is significant; it indicates that the form of argument Descartes has in mind is "it is to me as if  $\Phi$ , therefore I exist"; but since, as we have observed, what the protagonist ought to be imagined as saying to himself is not "it is to me as if  $\Phi$ ," but simply "it is as if  $\Phi$ ," once again no conclusion about the existence of a conscious subject *I* seems directly to follow. Looked at in this light, the argument from *cogito* may be better regarded, not as itself establishing the existence of anything at all, but as the distorted reflection of a gesture at recording, for successively chosen aspects of a Cartesian world, that each such aspect is *experienced*, *cogitatur*. Possibly what I call the self-stultifying form could be taken as the general case of this; but it does not seem likely, for once the questionable status of the word "I" at this point is squarely faced, the self-stultifying form appears to be shorn of its  $\pi\omicron\upsilon\ \sigma\tau\acute{\omega}$ . (Geach, *op. cit.*, reaches a similar conclusion.)

<sup>20</sup> I trust it is clear that I am not *recommending* this crypto-Cartesian concept of mind on its own account, although I do believe that it has better possibilities, both Leibnizian and otherwise, than the one which Descartes actually tries to employ.

the Second Meditation, would be subscribed to by Leibniz. Here, for example, is a comment on the argument from *cogito*:

I am thinking, therefore I exist. Descartes has well noted that this belongs among the first truths. But it would have been equitable not to neglect others quite on a par with it. Thus in general, it can be put in this way: truths are either of fact or of reason. The first truth of reason is the principle of contradiction or, what amounts to the same, that of identity, as Aristotle rightly observed. The first truths of fact are as many as there are immediate perceptions or, so to speak, conscious awarenesses. However, I am conscious not only of *myself thinking* but also of *my thoughts*; it is no more true or certain that *I am thinking* than that *this or that is being thought by me*. Hence the first truths of fact may conveniently be reduced to these two: *I am thinking* and *Various things are being thought by me*. From which it follows not only that *I exist* but also that *I am variously affected*.<sup>21</sup>

A later, perhaps more casual formulation is this:

As for the *primitive truths of fact*, these are the immediate internal experiences of an *immediacy of feeling* [*d'une immédiation de sentiment*]. And here it is that the first truth of the Cartesians or of St. Augustine is found: *I am thinking, therefore I exist*, i.e., *I am a being that thinks*. But we must know, that just as identities are general or particular, and as the one are as clear as the other (since the statement

<sup>21</sup> "Animadversions," I, 7; G, IV, 357; cf. L, pp. 632 f.; D, p. 48. The latter half reads in the original: *Veritates facti primae tot sunt quot perceptiones immediatae sive conscientiae, ut sic dicam. Non tantum autem mei cogitantis sed et meorum cogitatorum conscius sum, nec magis verum certumve est me cogitare, quam illa vel illa a me cogitari. Itaque veritates facti primas non incommode referre licebit ad has duas: Ego cogito, et: Varia a me cogitantur. Unde consequitur non tantum me esse, sed et me variis modis affectum esse.*

that *A is A* is as clear as the statement that *a thing is what it is*), so it is also with the first truths of fact. For not only is it immediately clear to me that *I am thinking*, but it is also wholly clear to me that *I have different thoughts*, that here *I am thinking of A*, and there *I am thinking of B*, etc. And so the Cartesian principle is a good one, but it is not the only one of its kind.<sup>22</sup>

These passages suggest that Leibniz, too, may have regarded the idea of a mind's "expressing a world," though a fragmentary and discontinuous one, and the idea of a mind as constituted by what ("intentionally") it perceives in the sense I have tried to evoke, as natural on Descartes's own principles, and Descartes's divergence from them therefore as unwitting self-betrayal. Whether Leibniz thought (as I have urged above) that the usurping concept of mind also shared blame for the eventual Cartesian catastrophe is a harder question, answerable only from a view of Leibniz's philosophy as a whole; on the view I shall set out, he did. At least it is plain that he was motivated to search energetically for an alternative; and if the foregoing is correct he found it, legitimate but mute, in the Second Meditation itself. This concludes our digression.

### 3. *The Harmony, and Phenomenalism*

My remarks about the notion of monad have so far been confined to *myself*. There is in addition, however, an infinity of further monads, each experiencing ("expressing") some universe or other in the way I do that which is immediately present to me, and each individuated by some feature of its perceptions. Clearly, however, no consideration yet introduced prevents these other monads from being wildly divergent in their perceptions from myself, and from one another. For example, the following is possible,

<sup>22</sup> *Nouveaux Essais*, IV, ii; G, V, 347 f.; cf. A. G. Langley (trans.), *New Essays Concerning Human Understanding*, 3rd ed. (La Salle, Ill., 1949), p. 410.

in some sense of "possible": to a certain monad Alpha things are more or less as they are to me, except to him it is as if extended beings are subject to an inverse-cube law of gravitation; this entails further differences, thus his universe as a whole is somewhat unlike mine. To Beta, the entire universe consists of six objects revolving about one another randomly. To Gamma, it is as if a C-major triad were sounding (and that is all). To Delta it is as it is to me, but temporally backwards. And so on. On this hypothesis, each monad would indeed express a certain universe, but some one and some another; there might be as many expressed-universes as monads.

That none of these possibilities is realized in the actual world is assured us by the principle of Harmony, which asserts that in fact the universe expressed by every monad is the same. Thus if it is to any monad as if  $\Phi$ , then it is to every monad as if  $\Phi$  (as before, statements of the form "it is to monad  $x$  as if  $\Phi$ " are to be regarded as translations for the reader's benefit from the private language in which monad  $x$  is imagined as describing his universe to himself). Leibniz's formulations of this principle ordinarily add that each monad expresses this universe "from its own point of view"; we are reserving that matter for study in its own right in Section 4, but it may be remarked here that the infinitude of the monads is supposed to be alternatively expressible by saying that there is a monad corresponding to every conceivable "point of view."

For the moment, however, the importance of the Harmony is this: given that the Harmony holds, the way is then open to interpret statements  $\Phi$  that ostensibly assert the holding of actual states of affairs in the realm of corporeal substances, as statements to the effect that to every monad it perceptually (consciously or not) is as if  $\Phi$ . Thus the theory is a phenomenalism, for it offers a reductive explication of statements about material things as translations or abbreviations of statements about perceptions;<sup>23</sup>

<sup>23</sup>  $\lceil$ It is to monad  $x$  as if  $\Phi$  $\rceil$  must, of course, be assumed to have a sense of its own that is specifiable in some other way than

but it differs from more recent and familiar attempts at such a reduction in two respects, both owing to the assumed vastness of the supply of minds and the assumed comprehensiveness of their perceptions.

First, the present view is unusually effective in meeting what we may call the "no-residue condition," the material condition of adequacy on such a theory which requires that the phenomenalistic translations should actually deliver the full content of the ostensible material-thing statements in their presystematic form. This helps to dispel the feeling, often voiced about phenomenalistic theories from Berkeley's day down to our own, that (to adopt the complainant's rhetoric) we have been swindled out of the real world of corporeal substances and have had palmed off on us some thin mental substitute. The soothing rationale is as follows: on the one hand, speaking in presystematic terms, it is of course clear that I could be deceived about  $\Phi$  (it could perfectly well be to me as if  $\Phi$  when  $\Phi$  was not true), even that all human beings were deceived about  $\Phi$ ; and so there would be small excuse for reading " $\Phi$ " as "it is to me (or to all human beings) as if  $\Phi$ ." As Frege observed, being true is different from being

---

as a function of the sense of "it is to monad  $x$  as if" and the sense of " $\Phi$ ". For we are proposing to explicate " $\Phi$ " as "it is to all monads as if  $\Phi$ "; so that, if "it is to monad  $x$  as if  $\Phi$ " cannot be understood except as segmented above (containing a real occurrence of " $\Phi$ "), it will have to mean "it is to monad  $x$  as if it is to all monads as if  $\Phi$ ", a most unwanted result, which would both compromise the reduction and bring us to the verge of an infinite regress. Furthermore, the result would be highly un-Leibnizian, for it cannot in any case be to a monad as if things are thus-and-so to other monads; the world of each is wholly self-contained ("windowless"), necessarily unaffected by what is going on in any other, or by whether any others exist at all. What then is meant by "it is to monad  $x$  as if  $\Phi$ "? Here again I can speak only for the monad that is *myself*: I know what I call its being (to me, pleonastically) as if  $\Phi$ ; and assuming that the Harmony holds, it must be somewhat similarly to others. The meaning of "somewhat similarly" will become clear when the differences between harmonious monads are discussed in Sec. 4.

taken to be true, whether by one or many or everybody, and in no case is to be reduced to it; there is no contradiction in something's being true which everybody takes to be false. Thus much for the justice of the complaint. On the other hand, the explanans proposed here does not stop short at any such paltry population of observers; here, in presystematic terms, every conceivable point of view of the universe is already enlisted among the monads,<sup>24</sup> and thus if it is to every *monad* as if  $\Phi$ , it is much harder than before to imagine what there is left for its really after all not being the case that  $\Phi$  to consist in. Harder, though obviously not impossible, on pain of circularity: it is always open to the objector to insist that all the monads can be deceived about the "real" world, never mind what that is; thus this reflection does not compel us to accept the phenomenalistic reduction proposed, but it does reduce the force of a usual intuitive scruple against it.

Second, the no-residue condition is met by this theory without recourse to subjunctive conditionals—whose use is practically imperative for any brand of phenomenalism that assumes the number, placement, and contents of actual minds to be more or less normal from a presystematic viewpoint. For on that assumption there are far too many gaps in the population's actual experience, too many unrepresented viewpoints and interrupted conscious histories, for attainment of the no-residue condition to be remotely within reach; it is thus that one is forced to the expedient of including, in the system's rendering of an assertion  $\Phi$  of objective fact, an immense amount of information concerning what would be perceived by a mind *A* if *A* were thus-and-so situated (as no mind happens to be), in addi-

<sup>24</sup> "You [des Bosses] ask further, why actually infinitely many monads? I answer, for this the possibility of their being infinitely many will suffice, since it is better that the works of God be the richest possible; but the same is required by the order of things, otherwise the phenomena will not correspond to all assignable percipients" [Letter of 20 September 1712, G, II, 460; cf. L, p. 988; R, pp. 268 f.].



tion to information concerning what (if anything) is actually being perceived relevant to  $\Phi$  by such minds as there are. Since there does not exist at present any satisfactory account of subjunctive conditionals, to say nothing of the idea of "relevance to  $\Phi$ ," we must call the theory's avoidance of them a very great merit.

(A third way of meeting the no-residue condition is to assume the existence of a single infallible and omniscient mind [call it G]; then  $\Phi$  can be rendered: it is to G as if  $\Phi$ . It is curious that Berkeley, who seems to have originated the subjunctive-conditional reduction, and who made extensive use of it in the *New Theory of Vision* to explain the interpretation of statements concerning, for example, the distance and magnitude and situation of objects, should in the *Principles* have dropped it completely [save for the briefest allusion in Article 3] upon tackling statements asserting the *existence* of objects, and thenceforth should have exclusively employed the third way, where  $G = \text{God}$ .<sup>25</sup> Why this shift, is an interesting question. The use of the third way in later idealism [where  $G = \text{the Absolute, or whatnot}$ ], is another matter.)

It must be stressed again, as it was at the outset, that the view here called Leibniz's is by no means to be found unalloyed throughout his writings. Even the reductionistic character of the monadism is not consistently maintained, this even in his latest writing, and where it is maintained the reduction is not always this one. Several causes are responsible: the surreptitious influence of earlier but abandoned views of his, his practice of shaping a given discussion to a given issue without sufficient attention to its consistency with his remarks (often to a different corre-

<sup>25</sup> It is worth recording that Leibniz, like most others of the time, did not perceive Berkeley's phenomenalistic motivation, or the phenomenalistic part of it, and took him to be a skeptic; he alludes to him as "the Irishman who attacks the reality of bodies" and speculates that he is "of the type who want to be known for their paradoxes" [to des Bosses, 15 March 1715; G, II, 492; cf. L, p. 993].

spondent) on a different issue,<sup>26</sup> and his notorious habit of writing in a *simplicite* fashion when he believes that the immediate occasion calls for popularization. An example of the last, I think, is Leibniz's way of explaining the Harmony as a concomitance that holds between events that take place in the mind and events that take place *in the body*—as if the latter category had some independent, un-reduced sense, as it has for Descartes and the Occasionalists; it is when he is contrasting his view with theirs that he has recourse to the analogy of the two clocks, which since Wolff's day has enjoyed undeserved prominence.<sup>27</sup> It scarcely needs saying that on this crude interpretation the Harmony would leave the kernel of the Cartesian difficulty wholly unaffected, and the theory would be, like Occasionalism, merely an illustration of the desperate follies to which a philosopher can be driven in the effort of coming to terms with it.

Again, Leibniz sometimes gives the impression that the Harmony, though a concomitance among monads, is the *result* of the monads' all perceiving the same independently existing physical universe,<sup>28</sup> rather than that the

<sup>26</sup> This seems particularly noticeable with the application of monadism to the Cartesian mind-body problem on the one hand and to the problems of dynamics on the other.

<sup>27</sup> Thus the "Second Explanation of the New System," G, IV, 498 ff.; cf. L, pp. 750 ff.; and many anthologies. Also the "Third Explanation," G, IV, 500 ff.; in Latta, pp. 331 ff. Also "Considerations on Vital Principles and Plastic Natures," G, VI, 539 ff.; cf. L, pp. 953 ff. Also Letters to Arnauld, 30 April 1687, G, II, 95; cf. M, p. 189; and October 1687, G, II, 113 f.; cf. M, pp. 214 f.; etc. In the original communication regarding the "New System" the "mutual agreement" holds between the soul and animal spirits together with blood; G, IV, 484; cf. L, pp. 747 f. For Wolff as publicist of the clocks, see Latta, p. 46.

<sup>28</sup> "All simple substances will always have a harmony among themselves *because* they always represent the same universe." Fifth Paper in the controversy with Clarke, par. 91; G, VII, 412; cf. L, p. 1160. Perhaps "represent" is meant "objectively"; but in that case the statement assumes the form "*p* because *p*." Cf. "It is of the nature of the soul to express what is happening in bodies, being so created originally that the series of its thoughts

Harmony is constitutive thereof; this again, if allowed to stand as Leibniz's view, would greatly diminish the interest of his theory, shearing the Harmony of explanatory power and leaving the notion of "perceiving the same independently existing physical universe" to remain unanalyzed.

But the deepest ambivalence concerns not whether the theory is reductionistic but the manner of the reduction. For Leibniz has another analysis of the notion of corporeal substance, and hence of "actual state of affairs in the realm of corporeal substances." This analysis renders a material thing as an "*aggregate*" of monads that go to *make it up*, in a sense held to be comparable with that in which a flock of sheep is an aggregate made up of the individual animals and also illustrated by piles of stones, armies of men, schools of fish, and the Dutch East India Company;<sup>29</sup> it renders a corporeal substance a "being by accumulation" of simple substances. This reduction is alluded to over and over in Leibniz's writings, from 1686 onward,<sup>30</sup> and seems to have had its roots in ideas dating from before his journey to Paris in 1672 (thus before he had become thoroughly acquainted with Descartes's works). It involves thinking of a monad as occupying a point in space at each moment, and thus in this respect at least being unlike a Cartesian mind; it also leads to the very difficult problem of explaining how the "aggregation" of unextended beings, spatially located or not, can result

---

agrees with the series of movements." Draft for letter to Arnauld of 28 November/8 December 1686; G, II, 71; cf. R, p. 260; M, p. 153.

<sup>29</sup> R. M. Yost, Jr., *Leibniz and Philosophical Analysis* (Berkeley and Los Angeles, 1953), pp. 9, 11.

<sup>30</sup> E.g., merely taking passages included in the Appendix to Russell, *op. cit.*, we find expressions of it at G, II, 58/R, p. 241 (Arnauld, 1686); G, II, 135/R, p. 241 (Arnauld, n.d.); G, II, 305/R, p. 252 (des Bosses, 1706); G, II, 339/R, p. 255 (des Bosses, 1707); G, II, 370/R, p. 272 (des Bosses, 1709); G, II, 399/R, p. 273 (des Bosses, 1710); G, VII, 329/R, p. 258 (unknown, 1710?); G, VII, 502/R, p. 272 (Bierling, 1711).

in something extended, a problem that Leibniz attacks by means of the notion of the monads' containing "*materia prima*," with what success is not clear. As time went on, Leibniz seems to have moved toward a more straightforwardly phenomenalist reduction, particularly in trying to break the literal positioning of monads at spatial points. As he reports in 1709:

Many years ago, when my philosophy was not yet sufficiently mature, I used to locate souls in points, and thus thought that the multiplication of souls could be explained by traduction, since many points can be made out of one point in the way that the apexes of many triangles can be made by division from the apex of a single triangle. But having grown more circumspect, I understood that not only are we led into innumerable difficulties in this way, but also that this [procedure] is, so to speak, a "shift to another kind."<sup>31</sup> Properties pertaining to extension are not to be assigned to souls, and their unity and multitude are not to be derived from the category of quantity but from the category of substance, that is, not from points but from the primitive force of action. But the proper action of the soul is perception, and the nexus of perceptions, according to which the later are derived from the earlier, makes up the unity of the percipient.<sup>32</sup>

His repeated attempts to free the theory of monads from its early dependence on a prior notion of an objective space in which monads are located have been traced by Russell;<sup>33</sup> these attempts can be taken as indicating also an effort on Leibniz's part at shifting from the reduction of corporeal objects as "aggregates" of monads, to the

<sup>31</sup> Leibniz uses a Greek phrase, *μετάβασις εἰς ἄλλο γένος* (category mistake).

<sup>32</sup> Letter to des Bosses, 24 or 30 April 1709, G, II, 372; cf. L, p. 973. The translated passage is a postscript occurring in the draft of the letter but "probably left out of the final copy" (Gerhardt).

<sup>33</sup> Russell, *op. cit.*, pp. 122-26.

phenomenal reduction that we have already sketched. Whether he himself succeeded in the attempts is of less importance than the fact that he was making them; and we shall find reason to reject Russell's conclusion—that the attempts were foredoomed to failure, that spatial location for the monads is inescapable—in the next section when we consider the monads' possessing a "point of view." Certainly on some occasions he succeeded in stating the idea with which we are concerned quite clearly:

It is true that what occurs in the soul ought to agree with what takes place outside it; but for this it is enough that events taking place in one soul correspond both with one another and with those taking place in any other soul; nor is it necessary to posit anything outside of all Souls or Monads; and on this hypothesis, when we say that Socrates is sitting, we mean nothing else but [*nihil aliud significatur quam*] that what we understand by "Socrates" and "sitting" is appearing to us and to the others concerned.<sup>34</sup>

What seems to me extraordinary is not that Leibniz did not fully extricate this view from its antecedents in his own thought and set it out clearly and consistently in its own right, but that he thought of it at all. For this means that he not only perceived the essential problem set by Descartes—namely, that of explicating the notion of a *matter of objective fact* within terms of objects of possible experience, much as that problem was later perceived by Berkeley, by Kant, and for that matter by C. I. Lewis—but that he saw a way of resolving it without dismantling the First Meditation—the method usual today—or deviating from a framework essentially Cartesian in spirit;<sup>35</sup> and that is remarkable indeed.

<sup>34</sup> To des Bosses, 16 June 1712, G, II, 451 f.; cf. L, p. 984.

<sup>35</sup> This is why, in the Cartesian digression of the previous section, I was at some pains to bring out the implicitly Cartesian roots of part of the idea of a monad.

#### 4. On *Distinctness among Monads*

At the beginning of the last section we imagined a universe consisting of *myself* and of various other monads expressing worlds quite different from mine: thus, a universe in which the Harmony failed.<sup>36</sup> On the principle laid down in Section 1, there is no difficulty in explaining the numerical diversity of disharmonious monads; for divergence between two monads in the worlds they express is certainly sufficient to count as qualitative distinctness, implying numerical distinctness by Indiscernibility of Identicals. But we are assured that the Harmony does hold—and that assurance is essential for the phenomenalist reduction that we are taking to be a main object of the entire theory. Given the Harmony, then, how do we understand the numerical diversity of monads that express the same universe?

Leibniz's standard answer to this question is to say that distinct monads differ in their "perspective" or "point of view"; and probably no image in his writings is more familiar than that by which he explains this idea, using the example of the change of visual aspect observed in a village while we make a circuit of its walls. I shall proceed on the basis that this is meant as a figurative illustration and not to be taken literally, both (1) because in the case it is meant to illustrate, the universe is not regarded as literally an independently existing reality for the monads to have perspectives *on*, and (2) because "point of view" cannot mean literally a standpoint in physical space—it being nonsensical to ascribe spatial position to a mind, and part of the program anyhow being to *define* spatial con-

<sup>36</sup> The possibility of disharmony raises a number of difficult problems which I do not have space to go into here. For example, it is not clear that the Law of Excluded Middle would hold in a disharmonious universe, in which case the Creator's choice of what universe to create may be subject to constraints of a kind that Leibniz appears not to allow for.

cepts (along with all others pertaining to extended beings) in terms of the nature of the experience of the various monads, so that to begin by explaining variety among monads in spatial terms would be to march in a circle. But though figurative, the analogy still has a clear enough point: given that the Harmony holds, monads are supposed distinguished from one another by something in their perceptions suggested to us by the introspectible difference between the experience of viewing a village from one spatial point and that of viewing it from another. The question is to understand clearly what this manner of distinction is.

One natural attempt at rendering in phenomenal terms each monad's enjoying a unique "perspective" would proceed in this way. We imagine the universe at a single instant of time, and we suppose that a certain fact obtains in the universe at that instant: say, that the planet Mercury is at perihelion. This means that to every monad it is perceptually (consciously or not) as if Mercury were at perihelion; the fact is so defined. The different monads, however, are aware of ("express") Mercury's being at perihelion in different ways; for example, to monad Alpha Mercury is behind the sun whereas to monad Beta Mercury is in front of it. To monad Gamma the earth occults Mercury, to monad Delta they appear apart. The descriptions given by each of the extended universe it perceives are identical, because the Harmony is in force, but to each one in addition it is as if it were perceiving the extended universe from a certain angle, as given by phenomenal perspectival distribution.

On closer inspection, however, this account proves to be at best incomplete. True, it does not commit us to the error of locating monads at spatial points (although we remain free to use the idea of spatial location of monads as a convenient fiction for heuristic purposes; thus a reader so inclined is not forbidden to draw himself a diagram illustrating the celestial situation just imagined and positioning the four monads thereon). What is omitted

by the account as given is the fact that once we regard each monad as perceiving a certain universe *in its entirety*, by admitting unconscious as well as conscious perceptions, the occurrence of "phenomenal perspectival distribution" ceases to be capable of counting as simply an introspected fact of whose nature each of us can remind himself by looking within, and comes to require an accounting of its own. We fail to notice this because we tend to think only of the conscious fraction of the experience of such a monad as myself or the reader, where I, say, am explicitly aware of (am at this moment entertaining, for example, an as-it-were visual *cogitatio* of) certain surfaces of a certain object, whereas my companion who, in presystematic terms, stands a little way off and sees it from another angle, has a corresponding object in his experience but is explicitly aware of certain other surfaces of it—back and side, perhaps, while I see side and front. But now consider the totality of the monad that is myself; these perceived surfaces are merely scattered fragments of an entire universe which, taken as a whole and (this is the point) leaving aside different degrees of my consciousness of different parts of it, I do not "view from an angle" or "point of view" or "with a perspective"; the whole of it is equally present to me, so that with respect to it, if it is correct to say that I am anywhere, then I am everywhere.

It may help in understanding this to consider the case of God, that monad which is conscious of all of its perceptions to the maximum possible degree.<sup>37</sup> This being cer-

<sup>37</sup> It seems that Leibniz holds that there is such a monad; it has been questioned whether he holds that it is the same as God, despite some passages in his correspondence that seem to suggest this. Whether he *can* consistently identify any monad with God—the being which brought the totality of monads into existence, acting for the best by creating maximum harmony with maximum diversity, etc.—is doubtful indeed. For an acute discussion of Leibniz's difficulties on this and related points, see Russell, *op. cit.*, pp. 172–90, esp. pp. 187 f. I shall continue to use the term for the maximally conscious monad, since I am not discussing the Creator in this paper and the confusion, if any



tainly does not regard the (his) universe from a particular point of view; to the contrary, the gigantic entirety is supposed to be immediately present to him, viewed from every side or from none—it makes no difference—past and present and future, with maximum consciousness of every portion.<sup>38</sup> In exactly the same way, any other monad which is conscious of the entirety of its universe to a uniform degree, whatever that degree may be, will lack a “point of view” on its universe in the sense of “point of view” that we tried to understand by considering phenomenal perspective. It will not be to it as if it had, or was observing from, any location; it will be “everywhere” just as God is, only dimmer. These considerations suggest that the cause of us other monads’ (myself, my companion, Alpha through Delta, for example) seeming to behold our universe(s) *from a place*, perspectively, is that the distribution of degrees of consciousness over our perceptions is not uniform; it is the differentiation between the relatively consciously perceived surfaces and aspects, and the relatively unconsciously perceived remainder, that we *interpret* as the centricity of our experience in the sense that we attempted to invoke as a reading for “point of view.”<sup>39</sup>

This explanation of centricity (in the foregoing sense) in terms of degree of consciousness might be objected to on projective grounds. For example, consider the follow-

---

occurs, is harmless. But I would not be taken to prejudice either the point of Leibniz scholarship or the point of theology.

<sup>38</sup> “God . . . views all aspects of the world in all possible ways.” *Discourse on Metaphysics*, XIV (G, IV, 439; cf. L, p. 478), one way of understanding the assertion that God is everywhere.

<sup>39</sup> It should be recalled that the “minuteness of perceptions” that we presystematically associate with perceiving objects that are a long way off is considered to be a species of confusion and thus of marginal consciousness; cf. n. 3 above, and Yost, *op. cit.*, pp. 41 ff. Thus a slogan I once heard, “The nearer the clearer,” in a way is correct, though *ordine fenomenalistico* it ought of course to be reversed.

ing case. It is to me as if there is a certain spherical object A, and a second, larger, spherical object B, and furthermore *it is to me* (consciously, at the moment) 'as if A exactly occludes B. Now, it may be thought, no matter how far my degree of consciousness of my universe were to be raised, so that A came to seem (as it were) ever more transparent and I discerned the parts of B ever more finely, it nonetheless would necessarily remain the case that for me A and B appeared to overlap, and therefore also that I was beholding my universe as if from a point—here identifiable as the intersection *i* of the straight lines tangent to both A and B. Arguing similarly with respect to the rest of my expressed universe, we should arrive at the conclusion of the whole affair's being beheld as it were from *i*; thus, it would be maintained, the notion of "point of view" retains a sense independent of the assignment of degrees of consciousness over perceptions. This reasoning probably had some force for Leibniz; it may in some tacit way have underlain his continuing to use terms like "metaphysical point" for monads while trying not to identify them with points in physical space. But it is nevertheless not wholly convincing. A counterargument is this: at the outset it is to me consciously as if A exactly occludes B, from which it follows that at the outset A and B are identical to me in apparent magnitude, from which it follows that at the outset I can discriminate equally many parts of the same apparent magnitude in A as in B. But let me now perceive B as clearly as A; then I have discriminated the parts of B as finely as I have discriminated the parts of A, in the sense of discerning their parts down to the same real magnitude in each. This means that for these parts, sameness of real magnitude is (unlike before) manifested in sameness of apparent magnitude.<sup>40</sup> B being larger, I have now discriminated a greater number of parts in B than parts of the same real magnitude in A, thus a greater number of parts in B than parts of the same ap-

<sup>40</sup> Cf. the "clearer the nearer" principle of n. 34, and n. 3.

parent magnitude in A; from which it follows that now A and B are not identical to me in apparent magnitude, from which it follows that A does not exactly occlude B, for me, any longer. In this way (among a number of possible ways) we can see that to the degree that we suppose a monad perceiving the as-it-were remote portions of his universe ever more clearly, to that degree we weaken his feeling that he is perceiving them as if from a point with reference to which they are remote; as his consciousness of his entire universe rises, the notion of his location at *i* (or what answers to it for him) begins to evaporate altogether. My explanation of its being to me at a certain conscious level as if A exactly occludes B, therefore, is that I am confusedly perceiving one aspect of a spatial relationship that holds in my expressed universe—namely, that straight lines tangent to both A and B intersect at *i* (*i* being, as it may now be useful to mention, in the very immediate neighborhood of that extended being—also “objectively” in my expressed universe—that I call “my [or, Furth’s] body”); as my confusions were dispelled, and I saw the situation more completely, I should find myself no longer regarding it as if “from a point” or “from the vicinity of this body” at all. (We are of course considering only a single instant of time; no one would propose an explication of “point of view” in as-it-were spatial terms that located every monad *permanently* as if at the same point.)

In the light of the foregoing, it seems that the numerical diversity of harmonious monads can reside only in differences in the clearness or degree of consciousness with which they experience various portions of their universe(s); if Leibniz’s talk of “perspective” comes to anything, it must come to this. It follows that in describing an individual monad, it is necessary to specify not merely what it perceives—for with the Harmony in force this specification will always be the same—but in addition the intensity or clarity with which it perceives each part of it. And this observation becomes of more than passing inter-

est when we reflect that it is the latter part of the specification, and only this, that prevents Leibniz's theory from coinciding with Spinoza's; for, given the Harmony and ignoring differences of clearness, the totality of monads at once are identically qualified, and thus by Identity of Indiscernibles are identical, collapsing into a single object which appears to be Spinoza's single substance taken simultaneously under the attributes of Extension and Thought.

It is worth noting that Leibniz himself on several occasions evinces a clear awareness that in its new setting the notion of "point of view" needs to be explained, and that the explanation should be in terms of degrees of consciousness or clarity of perception:

Each monad[']s nature being representative, nothing can limit it to representing only a part of things; although it may be true that this representation is but confused as regards the detail of the whole universe, and can be distinct only in the case of a small part of things, that is to say, in the case of those which are "nearest" or "greatest"<sup>41</sup> in relation to each of the monads; otherwise each monad would be a divinity. It is not as regards the object but only as regards the modification of the knowledge of the object, that monads are limited. They all tend confusedly toward the infinite, toward the whole; but they are limited and differentiated by the degrees of their distinct perceptions.<sup>42</sup>

Another indication occurs in the Preface to the *Nouveaux Essais*, where, in the course of his lengthy and enthusiastic recital of the merits of recognizing unconscious perceptions, Leibniz observes:

This knowledge of unconscious [*insensibles*] perceptions serves also to explain why and how no two souls,

<sup>41</sup> The quotes are my addition, it seeming that Leibniz means *apparent* situation or size.

<sup>42</sup> *Monadology*, §60; G, VI, 617.

human or other, of one and the same kind,<sup>43</sup> ever come perfectly alike from the hands of the Creator, and each has always from the first a reference to the point of view it will have on the universe. But this indeed follows already from what I observed regarding two individuals, namely, that their *difference* is always *more than a numerical one*.<sup>44</sup>

To this latest claim concerning diversity among monads an objection can be raised which must be faced at this point. "Surely," it may be argued, "Leibniz must subscribe to some form of the view that the perceptions of one monad are distinct even from those of another which is harmonious with it. Perhaps this is what is intended by another metaphor of his, that of windowlessness. That monads are windowless could mean, for them, something corresponding to what 'I don't have your pains' and similar truisms mean for Cartesian egos or for minds understood in some pretheoretic way. Thus, suppose that it is to monad Alpha as if  $\Phi$ , and that it is to monad Beta as if  $\Phi$ . Surely it is open to Leibniz to hold that the two monads are identically qualified in the sense of having perceptions of the same state of affairs (in the 'intentional' sense of Section 1), while nonetheless these perceptions are themselves numerically distinct. And a consequence will be that even if we ignore the distribution of degrees of consciousness over their perceptions, Alpha and Beta can be harmonious without being indiscernible and therefore being identical."

This suggestion can be interpreted in either of two ways, but in either case the suggested option does not seem to be open to Leibniz. The argument is that there can be two substances that *are* identically qualified in the sense of "identically qualified" with which we have been working from the outset (what the monads are "objectively")

<sup>43</sup> Perhaps this means, "however alike they may be." Editions diverge as to the text here.

<sup>44</sup> *Nouveaux Essais*, Preface, G, V, 50 f.; in Latta's translation, pp. 379 f.

perceiving is the same), and yet that these qualities can themselves be regarded as numerically distinct. What will that mean? I can see only two meanings. (1) On the first, what we have in mind is that while it is to Alpha as if  $\Phi$  and it is to Beta as if  $\Phi$  nonetheless the *occurrence* of this quality in Alpha differs from its occurrence in Beta, and for *this* reason Alpha differs from Beta. I think we can dismiss this interpretation on Leibniz's behalf immediately, since its effect is to subvert the application of the Identity of Indiscernibles; at least I do not see what case of numerical distinctness the Identity of Indiscernibles principle is supposed to rule out, if not this one.<sup>45</sup> (Why are the occurrences distinct? Because the objects are two?) (2) The other interpretation of the suggestion is as follows. "Leibniz's metaphor of windowlessness," one may argue, "itself indicates that Leibniz holds that its being to Alpha as if  $\Phi$  and its being to Beta as if  $\Phi$  just are different qualities (as a result no two monads, even harmonious, agree in *any* quality); thus it still is unnecessary to fall back on the distribution of degrees of consciousness over their perceptions to differentiate them." This interpretation, while not inconceivable, is still unsatisfactory. First, when Leibniz himself is trying to explain distinctness among monads, he does not use the windowlessness metaphor—which might suggest, if he did, that some such strong sense of "distinctness" was intended—but instead always reverts to the point-of-view metaphor, which we have already examined. Second, when he is trying to justify the Identity of Indiscernibles principle, he frequently argues that "no two *perfectly* indiscernible things (in some ordinary rough-and-ready sense of "thing"; for example,

<sup>45</sup> But Leibniz does once perversely use a principle that could be generalized to give just the view we are dismissing; see the Fifth Paper in the controversy with Clarke, G, VII, 401; cf. *L*, p. 1147. I owe this reference to Mr. Kenneth Clatterbaugh, who also suggested to me a somewhat different form of the objection I am now analyzing. I should also mention useful suggestions on the point by Roger C. Buck and William R. Robinson.

leaves from a tree) are to be found in nature,"<sup>46</sup> implying that two ordinary things can be qualitatively identical in some respects, only never in all respects ("perfectly"). If his view of monads were such that no two monads could be qualitatively identical in *any* respect, then when he came to apply the Identity of Indiscernibles principle to monads, one would expect him to mention the fact; but this he does not do. Third and last, the objection does not attach sufficient weight to the point that we have already so stressed: that what is immediately present in the (conscious and unconscious) awareness of a monad is: an entire physical universe. In the case of a Cartesian ego there is a case for saying that it entertains *cogitationes*, bits of conscious experience, and for arguing that one such ego's *cogitationes* are numerically distinct from those of any other; but the qualities of a Leibnizian ego are given by a description of the total universe it expresses. This is the very reason why, from Leibniz's own explanation, if the same description is given of the universe of monad *a* and that of monad *b*, then monad *a* and monad *b* will coincide (unless sense can be given to their nevertheless having different "points of view").

It remains to mention some minor points. First, in the light of the foregoing how is the "windowlessness" metaphor to be taken? It seems best to regard it simply as pointing up the notion that the monads do not causally affect or communicate with one another; but it appears a poor policy on the whole to express this by locutions like "I don't have your pains." For example, suppose it is to me now as if a needle were piercing the extended substance Furth's foot. By the Harmony, therefore, it is to *every* monad as if a needle were piercing the extended substance Furth's foot. My perceptions of this state of affairs are moderately high on the consciousness scale, though of course very paltry and confused compared with

<sup>46</sup> See, e.g., the fourth letter to Clarke, G, VII, 372; cf. L, p. 1117.

God's—God, for instance, knowing with maximal consciousness how this state of affairs is necessarily connected with every other in the extended universe, whereas I am awake only to a tiny local portion of it. (The more of it I were awake to, the less I should describe the situation in terms of pain; here Leibniz resembles Spinoza.<sup>47</sup>) No other monad who is awake to approximately the general degree that I am (no other human mind) happens to be consciously aware of this particular state of affairs, or so I believe. There is, however, no contradiction in supposing that a certain such being should be not only awake to it, but aware of exactly that aspect of it and to exactly the degree of consciousness that I am. And if that occurred, there would be nothing against saying that that monad had my pain, this without crossing the "windowlessness" condition in the least. That monad would remain quite distinct from myself, so long as we differed elsewhere in our degree-of-consciousness assignment to our perceptions. (Thus according to this theory, that I do not have your pains, if true—as I believe it to be—is contingently true.)

A second point concerns a drawback in the theory as we have set it up to account for distinct harmonious monads, but the drawback is perhaps more aesthetic than substantial. The actual world is held to be the "best" of all possible worlds, where "best" means possessing maximum variety together with maximum order. The order is furnished by the Harmony, the variety by the infinite multiplicity of monads, each with its unique point of view. But as we have seen, the only way of retaining perspectival distinctness among monads is by including the degree-of-consciousness assignment in the definition of each. In that case, the thesis of maximum diversity would indicate that there should exist a monad for every possible distribution of degrees of consciousness over perceptions. This means, for example, that there exist innumerable many monads

<sup>47</sup> Pain is due to "passivity" in the monad, a species of confusedness of perception. See G, IV, 441; and Russell, *op. cit.*, p. 142.



that are conscious of exactly the perceptions that I am conscious of, and to the same degree, but in addition are conscious of some others that I am not conscious of; for example, to one of them it is consciously exactly as it is to me, but in addition he is simultaneously awake to a cluster of events currently going on in the Andromeda galaxy, to which I am largely (though not, of course, completely) oblivious. Likewise over and over again, monads indiscernible from myself with respect to what I consciously perceive, but awake to various other portions of the universe to which I am asleep.

This idea seems to me unappealing. First, I (at least) harbor a prejudice that the number of monads *any* of whose perceptions are as conscious as, say, mine of the needle in Furth's foot, is extremely low relative to the totality of monads.<sup>48</sup> Second, Leibniz would probably wish to avoid the consequence of infinitely many monads differing by arbitrarily small degrees from God.<sup>49</sup> And finally, this view would seem to commit us to there being a "dominant" monad for *every* extended substance no matter how randomly scattered around the universe, which is presystematically unintuitive at best. Because I am thus disinclined to think that every possible degree-of-consciousness assignment is represented among the monads, I cannot hold that the Creator created the best of all possible worlds in Leibniz's (let alone any other) sense of "best." But this is not a major disagreement.

<sup>48</sup> I even incline toward thinking that it is finite, but without any good reason.

<sup>49</sup> Russell noted this; *op. cit.*, p. 188.



# INDIVIDUAL SUBSTANCE

IAN HACKING

I am concerned with a notion of substance captured by Leibniz's repeated assertions that individual substances are *no mere aggregates*, but are *active principles of unity*. It is only one strand of his theory of substance, but it is a pervasive one, and it is important in understanding monadology. It also bears on some recent philosophy, including Bertrand Russell's applications of the theory of descriptions, and subsequent developments associated with W. V. O. Quine and, by opposition, with P. F. Strawson. Although monadology is untenable, the "active principle of unity" assertion seems to me to be elementary, true, and often forgotten.

What I claim to be elementary and true, in connection with the notion of substance, is given in Section 4 below. To put the notion in its context, Section 1 distinguishes several distinct problems which concepts of substance have been supposed to solve. The next two sections are brief histories. Section 2 develops Cartesian and Berkeleian attitudes to substance. Section 3 details how Leibniz came to focus on the "active principle of unity" doctrine of substance while working on dynamics. In Section 4 I say what I think is true in this doctrine. Section 5 recalls the many features of monadology that pass beyond this simple truth. Section 6 concludes by mentioning some recent issues that relate to Leibniz's insight.

This essay has been written especially for this volume.

After the books by Russell<sup>1</sup> and Couturat,<sup>2</sup> most English scholarship has emphasized a different aspect of Leibniz on substance: his "predicate-in-notion" doctrine that the subject term (of some primary sorts of true propositions) means the totality of predicates possessed by the item denoted by the subject. In such primary sorts of propositions the subject is supposed to denote a substance; so substances must be the totality of their predicates, and truths about substances are analytic. On this interpretation, much metaphysics is obtained from a logical theory about the analysis of propositions. I have no quarrel with this view. One must supplement it by drawing on another tradition, ably represented by Gueroult,<sup>3</sup> that develops even more metaphysics from physics. The predicate-in-notion doctrine says substances are totalities of predicates, but cannot explain which totalities of predicates are substances. Leibniz assures us no mere totality will do. There are good reasons why not, but they cannot be found in logic.

*Active principle* seems to have been Leibniz's first deep thought about substance, and it persists throughout his life. In 1666, as a twenty-year-old writing on the art of combinations, he calls substance whatever moves or is moved.<sup>4</sup> Two years later substance is that which has a principle of action within itself,<sup>5</sup> and in 1676 the essence of substance is said to consist in the primitive force of action.<sup>6</sup> In 1686 he regularly uses such ideas, defending

<sup>1</sup> Bertrand Russell, *A Critical Exposition of the Philosophy of Leibniz*, Cambridge, 1900.

<sup>2</sup> Louis Couturat, *La Logique de Leibniz*, Paris, 1901.

<sup>3</sup> Martial Gueroult, *Leibniz: Dynamique et Métaphysique*, Paris, 1967.

<sup>4</sup> *Demonstratio Existentie Dei*, def. 2. In *De Arte Combinatoria*. C. I. Gerhardt, ed., *Die Philosophischen Schriften von G. W. Leibniz*, Berlin, 1875-90, IV, p. 32; hereafter cited as PS.

<sup>5</sup> G. W. Leibniz, *Sämtliche Schriften und Briefe*, ed. by Prussian Academy of Sciences, Darmstadt, 1923, VI, i, p. 508; hereafter cited as PA.

<sup>6</sup> Comments on Foucher de Careil. L. E. Loemker, *Leibniz: Philosophical Papers and Letters*, Chicago, 1956, p. 241.

what he says in the *Discourse on Metaphysics*,<sup>7</sup> and goes on doing so for the rest of his life. So although I am concerned with only one of Leibniz's thoughts about substance, it is at least an enduring one. It is instructive to note that the idea is developed chiefly while trying to solve problems in dynamics, not logic. Note also that although the writings around 1686 are, correctly, the basis of the Couturat-Russell "logical" interpretation of Leibniz, the correspondence with Arnauld (for example) of that time devolves not on concepts of substance arising from logic, but on the "active principle of unity" engaged by dynamics.

### 1. *Five Problems for Substance*

The word "substance" brings to mind many different ideas, for it was used in the answer to many questions. We have to recollect those seventeenth-century problems for which Leibniz used the word and discount those for which he did not use it much. Every notable philosopher seems to have seen the relation between questions in very different ways, and it is important not to foist on Leibniz the perceptions of a Descartes or a Berkeley. To begin altogether superficially, here are some possible names of problems.

There is a *problem of creation*: the word "substance" has been used to mean anything self-caused. There is a *problem of predication*, arising from the fact that in any true predication, some quality is attributed to an entity; "substance" has been used as the name of the kind of entity capable of having qualities. There is a *problem of matter*: what is the stuff—call it "substance"—of which the physical world is made? There is a *problem of identity*: Alexander the boy and Alexander the potentate have few qualities in common, yet they are the same person; their substance must be what remains the same as the boy matures. There is a *problem of simplicity*: the complexes of

<sup>7</sup> In the 1686 correspondence with A. Arnauld, PS II.

the world ought to be built from simplexes, and the simplexes are substances.

## 2. *Descartes and Berkeley*

Five problems calling for "substance" have just been labeled creation, predication, matter, identity, and simplicity. To understand Leibniz, it is especially important to grasp his idea of predication and matter. We should begin by contrasting two other patterns of connection. I attribute them to Descartes and Berkeley. We need these because Leibniz wrote in conscious opposition to Cartesianism and because it is the Russell-Quine theories stemming from Berkeley that, I claim, are partly put in question by Leibniz's active principle of unity.

Descartes said God is the only self-causing thing. So in the sense of a problem of creation, there is only one substance. But according to Descartes, the word "substance" is ambiguous; it can properly be used in another sense to answer a problem of predication. In this sense, there are many substances. Whenever there is predication there is, he maintains, a substance possessing the attributed predicate. Substances can be conceived through themselves, or at any rate, every substance is known through a principal attribute, namely, an attribute whose possession is presupposed by every other attribute of the substance in question.<sup>8</sup>

The doctrine of principal attributes is made to imply that there are two kinds of substance, mental and physical. Although Descartes kept distinct our first two problems (creation and predication) he takes the third, the problem of matter, under the wing of the second. Matter is characterized by the principal attribute of one of the two kinds of substance, namely, extension. The doctrines and arguments relating the problem of matter to that of predication are subtle and technical, but they definitively

<sup>8</sup> René Descartes, *Principles of Philosophy*, I, LI-LIII.

stamped most later European philosophy. Leibniz is almost unique in rejecting them soon. It is possible to read most other treatments of substance—especially those of the British empiricists—in a Cartesian way. We must be warned against doing the same to Leibniz.

It was manifest to Descartes that where there is predication there is substance. Locke found this mysterious. Substance, the bearer of attributes, cannot be characterized independently of the attributes it bears and hence must be an "I know not what." Locke's parody invites an alternative view, that we need not postulate any entity bearing the attributes, over and above the very bundle of attributes. A thing is but a collection of properties. Descartes, in an atypical remark to Burman, had already said as much: "All the attributes taken together are in truth the same thing as substance."<sup>9</sup>

Berkeley is commonly taken as the first bold proponent of this view. It is a complicating fact that the first target of *his* attack was not substance as an answer to a problem of predication, but substance as an answer to a problem of matter. Berkeley's *Commonplace Book* reveals an obsessional hatred of matter. Today phenomenalism is pap about the analysis of words. It was once a strong claim about the world. Berkeley thought the world was made only of mental stuff. He was, in Leibniz's words, "the Irishman who doubts the reality of bodies."<sup>10</sup> But Cartesians took the problem of matter under the problem of predication. Writing in a Cartesian period, Berkeley thought himself constrained to do the same. Rejecting matter, he also rejected individual substances as the bearers of predicates. It is not impossible to read Berkeley as a Cartesian monist, believing in a single mental substance that is also divine. At any rate, Berkeley is not against every idea of substance, but he is against individual substances, which are, in his opinion, just bundles of qualities.

<sup>9</sup> C. Adam and P. Tannery, *Oeuvres de Descartes*, V, p. 154.

<sup>10</sup> To des Bosses, 15 March, 1713. PS II, p. 492.

In the opinion I oppose to that of Berkeley, when the tulip is yellow, there is some substance with the attribute yellow. In the view I attribute to Berkeley, yellow color, characteristic shape, waxy texture, and slight fragrance go together, and *are* the tulip. There is no individual substance, only a concatenation of qualities. Many philosophers appear to find this idea intelligible. Hume was perhaps ironical in saying that we have "no idea of substance, distinct from a collection of particular qualities,"<sup>11</sup> but that idea has been one enduring analysis of substance. I think it is an obscure analysis, but recently it has been somewhat clarified by Strawson's discussion of feature-placing languages.<sup>12</sup> Strawson describes a language in which there would be no overt reference to things, only to qualities going together. He aims at showing that such a language is unspeakable, but on the contrary, he does, I think, make the idea of such a language intelligible. Anyone who at first finds it unintelligible should consult his chapter. Here I take it for granted. I am concerned here only to observe that there are two distinct theories in Berkeley, engendered by two distinct problems. The problems are predication and matter, bound together by a sophisticated—and often submerged—Cartesian analysis. Berkeley's solution to predication is "bundle of qualities"; to matter, phenomenalism.

The "bundle-of-qualities" answer to predication is relevant to Leibniz. In contrast I refer to phenomenalism only to avoid it. There are two reasons for this caution. First, Leibniz seldom conflated the problems of predication and matter. Much of his anti-Cartesian polemic should be read as a direct attack on the practice of confusing them. But because other philosophers have conflated them, and because phenomenalism has thereby been made to seem integral to views on substance as answer to a problem of predication, one might think the connection is also to be found in Leibniz. It is not.

<sup>11</sup> David Hume, *A Treatise of Human Nature*, I, I, vi.

<sup>12</sup> P. F. Strawson, *Individuals*, London, 1959, ch. 7.



Second, it is well known that Leibniz himself can be called some sort of phenomenalist; Furth's "Monadology" in the present volume reminds one why. One could go further and draw amazing conclusions from this sentence written by Leibniz: "If a thing is not actually sensed, then there is no thing."<sup>13</sup> But Leibniz's phenomenism has quite different roots from that of Berkeley and has nothing directly to do with a theory of substance.

In what follows, when I allude to Berkeley, I shall be concerned only with the non-phenomenalist part of Berkeleyan reduction, the reduction of things to bundles of qualities and the concomitant rejection of a notion of substance. This part of Berkeley's theory is immensely aided by Russell's theory of descriptions; Russell and Quine have gone far toward showing how to describe the world without using expressions denoting things. Russell has said it is largely an accident of our languages that the subject-predicate logic and the substance-attribute metaphysics have been so dominant in our civilization.<sup>14</sup> Quine has urged a canonical language informed by better philosophy and less committed to suspect entities.<sup>15</sup> Against such writers, I contend that facts noticed by Leibniz show substance is no accident.

### 3. *The Analogy from Dynamics*

Leibniz's treatment of substance is in part derived from an Aristotelian tradition, although he writes for a Cartesian audience. He regularly uses the term "individual substance" as opposed to "material (or 'corporeal') substance." The former is akin to Aristotle's first substance. First substances are, as G. E. M. Anscombe puts it, the

<sup>13</sup> A revision note of about 1700 to a 1667 essay on jurisprudence. PA VI, i. p. 269.

<sup>14</sup> Bertrand Russell, "Logical Atomism" (1924), in *Logic and Knowledge*, London, 1956, p. 330. Cf. Russell, *An Inquiry into Meaning and Truth*, London, 1940, p. 129.

<sup>15</sup> W. V. O. Quine, *Word and Object*, New York, 1960.

sorts of things that can be named.<sup>16</sup> They form part of an answer to a problem of predication. This is equally true of Leibniz's individual substance. Corporeal substance, in contrast, is an answer to a problem of matter. Berkeley, taking something but only something from Descartes, tends to combine material and individual substance in the same concept; Leibniz keeps them quite separate.

Even Leibniz cannot keep them entirely distinct, and his discussion of matter does permeate his discussion of predication. But it is by open analogy, not concealed confusion. Leibniz's discussion of matter is in the first instance a discussion of physics, and Leibniz uses physical theories, worked out for matter, as a model for part of what he wants to say about predication. There is, then, a connection, but it is a connection different from that invented by Descartes or purveyed by Berkeley.

Descartes says extension is the essence of matter. To-day we read this as a philosophical thesis and challenge it with conceptual difficulties. Leibniz took it to be at least in part a physical thesis, and bad physics at that. Here Leibniz is more faithful to Descartes than we. The Cartesian thesis was felled not by concepts but by its sheer inability to provide a framework for dynamics. Leibniz *proved* that no theory based on extension can account for the laws of motion. Even the pineal-gland theory of interaction between mind and body was not bad psychology, as we now make out, but, as Leibniz observed, bad physics. On Cartesian laws of conservation, such interaction is intelligible, but on the true laws of conservation of energy, it is impossible.<sup>17</sup>

Physics is not only an anti-Cartesian device; it positively molds Leibniz's philosophy. Gueroult has an extensive exposition of how Leibniz's metaphysical theses

<sup>16</sup> G. E. M. Anscombe and P. Geach, *Three Philosophers*, Oxford, 1961, p. 7.

<sup>17</sup> "Considerations sur les principes de vie," 1705. PS IV, p. 539.

were engendered by physics.<sup>18</sup> We need consider only one aspect of this influence. In trying to solve the problems of dynamics, Leibniz became convinced that the individual particles entering into dynamical relations must each be characterized by principles of action. The dynamical properties of a system derive from principles of action concerning each participant. This denies not merely the laws proposed by Descartes, but the very conceptual foundations of Cartesianism. Descartes's matter is passive. Kinetic energy was not merely a new concept, but a revolution in the way one conceives dynamics.

Gueroult has shown how Leibniz's dynamics fostered the pre-established harmony, because dynamical particles could not "interact" in the sense of something being passed from one to the other. Each, it was thought, developed according to its own laws of action. Such ideas led Leibniz to anticipate Hume's constant conjunction analysis of causation.<sup>19</sup>

The conceptual apparatus through which Leibniz advanced dynamics is applied, by analogy, to individual substances. Individual substances become characterized as foci of action much like the elements of a dynamical system. The elements of a dynamical system are also made much more like souls. It is no accident that the *conatus* in terms of which Spinoza described the strivings of animate beings is the *conatus* that seventeenth-century physicists worked into the equations of dynamics.

<sup>18</sup> Cf. note 3. See also, R. Catesby Talafiero, *The Concept of Matter in Descartes and Leibniz*, Notre Dame, 1964, and Gerd Buchdahl, *Metaphysics and the Philosophy of Science*, Oxford, 1969, ch. vii, for valuable studies of the interplay between Leibniz's physics and his metaphysics.

<sup>19</sup> In the analysis of causation by expression: "One thing expresses another (in my terminology) when there is a constant and regular relation between the one and the other." Letter to Arnauld, 9 October 1687. PS II, p. 112.

#### 4. Active Principle of Unity

Individual substances are characterized as foci of action. What does this mean? What is it for a substance to be an active principle of unity? Genetically it is modeled, by analogy, on dynamics, but that does not tell us literally how it bears on the problem of predication. I propose to explain how it bears, by way of opposition to the doctrines later evolved by Berkeley through Quine.

Leibniz was as much an advocate of canonical language as any subsequent philosopher. Couturat's *La Logique de Leibniz* indicates (and recourse to the original confirms) that Leibniz had a very good hunch about how the predicate calculus would go.<sup>20</sup> Moreover, he would reduce singular assertions to a sort of prenex normal form. A prefix would be *ens* or *res*: then would follow the various predicates which were asserted to combine in the thing spoken about. He lacked a theory of descriptions to paraphrase away referring expressions, but was sure that there is no vital difference between substantives and adjectives, except that the former commit one to an assertion of a definite being, thing, or individual substance. In saying that the boy writes, one says not only that boyhood and writing are combined, but also that a definite individual combines the attributes of male youth and writing. Leibniz insisted on using a substantival quantifier. It is not just a way of assuring uniqueness of reference. We often read  $(\exists x) (Fx)$  as "something is *F*," but canonically we do not have to mean some *thing* is *F*, but only that *F* is instantiated. Leibniz said that in at least some utterances we ought to mean some individual substance is *F*.

Not any collection is an individual substance. We can think of piles of rubble or the Dutch East India Company as things, but they are aggregates. We can give one name to, say, the pair of stones consisting of the diamond of the

<sup>20</sup> *Op. cit.*, p. 70.

Grand Mogul and the diamond of the Grand Duke. But naming it "dogul" does not make it more than an aggregate.

What is wrong with the dogul? It is just as unique an entity as the unique diamond of the Mogul, which we can call the "mog" for short. Both are owned, in part or in whole by the Mogul. Both items can be named, as I have just done. Both, then, are first substances for Anscombe's Aristotle. Both are values of a variable. Can any differences between the dogul and the mog be noted by philosophical categories?

One difference between the mog and the dogul is that there are vastly more contingent, simple, known empirical laws about the mog than the dogul. The mog can be thrown. It conducts heat continuously and uniformly. The Mogul can swallow the mog, but not (at present) the dogul.

More fanciful examples illustrate the difference better. Suppose, with Berkeley, that things are bundles of qualities. Is any bundle of qualities a thing? Well, on first writing this essay my hand held a black fountain pen and rested on a yellow pad. One bundle of contiguous qualities was the bottom part of my pen, the inside of my thumb, and a bit of yellow paper. Call this bundle of qualities my "berk." My pen and my berk differ. As a matter of fact, but not of logic, my pen, all by itself, can be thrown, heated, repaired, crushed, locked away, and wiped when wet. It can be posted, buried, and the like. It is hard to do many of those things to my berk, all by itself.

There are vastly more true, intelligible, and for us important regularities about pens than about berks. The difference is well summarized in Leibniz's terms. A berk is a mere aggregate. A pen is more. Pens do all sorts of interesting things and can have all sorts of interesting things done with them. Berks might be like that, but are not. A "bundle of qualities" is more than a mere aggregate when it does things and has things done to it.

"Active principle of unity" is apt here. We tend not

to think of pens as active. Leibniz, opponent of Descartes's physics, had no such difficulty. Pens have laws of their own, just like more active individuals such as mice and motorcycles. If I throw a pen at a mouse on the floor, I am active. We tend not to think of the projectile as active once it leaves my hands. But although it has no will, no animation, it is in dynamical terms active and a source of action, possessed of kinetic energy. It is not unnatural to say that the berk does not have comparable laws of its own. There are known regularities about pens, thumbs, and paper, all of which the scribe relies on. The laws of berks are derivative from these. So much is contingent. A conceptual scheme in which berks play a cardinal role is at least imaginable. But it is not our conceptual scheme.

Pens are "active." Or, if one rejects this bit of seventeenth-century physics, we at least assent to Leibniz's adolescent formulation of "active," "whatever moves or is moved." What of "principle of unity"? Leibniz and perhaps even Descartes had the idea of a substance being a bundle of qualities, just as much as Berkeley. The important question is the reverse. Which bundles are substances? Only those bundles that are active, in the sense of having laws of their own. Laws provide the active principles of unity. There is a tendency in much analytic philosophy to conceive *things* as given, and then to speculate on what laws they enter into. On the contrary, things are in the first instance recognized by regularities.

## 5. *Monads*

There is vastly more to monadology and "active principle of unity" than the preceding rather weak account. Readers familiar with Leibniz will know that from the beginning he protested against the interpretation just given. My contention is that he did this not because he thought it false as far as it goes, but because he wanted to go much further. I am trying to extract the truth as far as it goes, so I shall be brief with those ramifications

of "active principle" that take us into deeper monadology.

Arnauld himself tends to interpret Leibniz as I have been doing. In reply, Leibniz is at pains to say that not every law-governed thing is a substance. If you stick the two parts of the dogul together on a brooch, you get an eminently hard and throwable thing, but Leibniz uses this as an example of a mere aggregate. Even a solid slab of marble is aggregate only. Why? Because, says Leibniz, the mason can snap it in half, and that proves it is not substance.<sup>21</sup>

Even a working machine with internal principles of action fails to make the grade. "The unity of a clock," he reminds an objector, "is quite different from that of an animal, for the latter is able to be a substance endowed with a true unity like what one calls *I* in ourselves."<sup>22</sup> The impermanence of a slab of marble is one reason for not counting it a monad. But animals which *are* substantial, appear to decompose more surely than watches, so we have something more fundamental at stake than observed impermanence. We have been writing as if laws of physics suggested an analysis of substance. But there is a reverse influence too, for all along, some puzzles of dynamics were to be resolved by taking the soul as model of action at a point. But the soul-model for substances is not publicly defended at length until the 1695 *New System of Nature*.<sup>23</sup> There we learn how "substances must be conceived in imitation of the idea we have of souls." "The substantial atoms" are "utterly devoid of parts" and "might be called metaphysical points." They are indivisible, immortal, and immaterial. Things are only well-founded phenomena.

There are many attractions in treating souls as active principles of unity. There is a built-in solution to what, in Section 1, I called the "problem of identity." Hume

<sup>21</sup> Letter to Arnauld, 8 December 1686. PS II, p. 76.

<sup>22</sup> PS IV, p. 494.

<sup>23</sup> In PS IV, pp. 471-503, which includes two versions and several "clarifications."

rejected such attractions and was left with a radically skeptical problem of personal identity that he could not solve, while Kant magnified the attractions and made the fundamental unity of apperception a cornerstone of his system. But it would be wrong to single out the *New System*, or any other document, as a chief source of Leibniz's plunge into monadology. The sheer indestructibility of substances was an early part of Leibniz's conception which I have passed by. At the beginning of his thinking he had dutifully called substances "self-subsistent."<sup>24</sup> Hence they are indestructible, so clocks and marble slabs cannot be monads.

Other students will, with Russell, prefer to trace monadology from the bold logical doctrines of 1686 and emphasize the theory of truth as the core of monadology. Or one may emphasize the *Monadology* itself, which begins by saying that there have to be simples because there are composites. Slabs, being composite, cannot be simples and so cannot be substances. This approach takes what I called the "problem of predication" as the core of monadology.

For myself, I would emphasize the role, in deeper monadology, of the problem of creation. Issues raised by the problem of predication are chiefly satisfied by an analysis of the sort given in Section 4. But we still have the question, asked seriously by Leibniz, of how anything came to be. To answer this question, the notion of substance is made to do far more work than mere contingent principles of unity. In the more metaphorical version of some of Leibniz's mature thoughts, substances are possible combinations of qualities that win the struggle for existence. The struggle occurs outside of (logically, prior to) creation. The game is for keeps. Monads come in at the beginning, and stay. The marble slab snapped is no longer a slab, and so no monad, now. Hence never a monad. So marble slabs, active principles of unity though they be, are not individual substances. The theory of creation is

<sup>24</sup> PA VI, i., p. 508.



beyond the scope of this essay. But if I come to choose a single theory that most transforms Leibniz's active principle of unity into monads, I would favor the theory of creation.

## 6. *Some Modern Substances*

No one is likely to agree with my perfunctory criticism of monadology, but all admit that monadology is untenable. I claim one part of it is valid. Substances are bundles of attributes, but not all bundles of attributes are substances. Only active principles of unity will do. This is not formally incompatible with doctrines advanced by Berkeley, blazoned by Russell, and to some extent preserved in Quine. It asserts only that those doctrines omit or conceal a fundamental feature of our world view. You need not use the word "substance" to make this plain. But at least we find a place for *things*. Recent philosophy is even using "substance" again.

Strawson's "feature-placing languages," to which I referred above,<sup>25</sup> take seriously the proposal that we can get along without a category of substance. Russell's theory of definite descriptions proves that lack would be no hindrance to deductive logic. But if there is such a thing as inductive logic, individual things matter. C. D. Broad's remarkable papers on induction emphasize what modern inductive logicians cover up: inductive logic presupposes both natural kinds *and* substances.<sup>26</sup> For example, the usual story about induction involves counting of favorable and unfavorable instances. But it matters to your counting whether you have the same instance or a new one. Induction thus depends on what principles of unity you employ. So much is plain from (although not explicit in) Strawson's chapter; indeed, what I call "principles of

<sup>25</sup> See note 12.

<sup>26</sup> C. D. Broad, "The Relation Between Induction and Probability, II," *Mind*, XXIX (1920), 11-45, especially sec. 7.

unity" he calls "the decisive conceptual step" from feature-language into substance-language.<sup>27</sup>

Strawson's observation about counting is an aside to his deeper, anti-Quinean, transcendental arguments for the primacy of bodies and persons in our conceptual scheme. The view I extract from Leibniz is in no way transcendental. It says only that as a matter of fact, in our macroscopic perceived world, some bundlings of qualities are useful for getting around, and those bundlings are what have traditionally been called "individual substances."

Unlike Strawson's contribution, Leibniz's view does not seem to have consequences for subject-predicate logic. Strawson hankers after names and referring expressions. Russell, whose theory of descriptions made the subject-predicate logic obsolete for deduction, thought thereby to get rid of substance. Strawson, arguing transcendentially for substance, tends to restore the deposed subject-predicate logic. But so far as Leibniz's active principles of unity go (e.g., not as far as monads), one might speak a Quinean canonical language and still have some notion of substance, namely, of those particular concatenations of qualities that are active principles of unity. Anyone persuaded that it is possible for Quinean to be a natural language will find this a reason for preferring Leibniz's notions of substance to Strawson's. I have argued elsewhere that some Amerindian languages are quite like Quinean and take this to be relevant here.<sup>28</sup>

David Wiggins' book on identity also employs substance extensively.<sup>29</sup> He follows the Cartesian tradition of saying every substance has a principal attribute, namely, a property of the thing, which is true of the thing just so long as anything is true of the thing. He rightly differs from Descartes in not insisting that substances have only

<sup>27</sup> *Op. cit.*, p. 207.

<sup>28</sup> Ian Hacking, "A Language Without Particulars," *Mind*, LXXVII (1968), 168-85.

<sup>29</sup> David Wiggins, *Identity and Spatio-Temporal Continuity*, Oxford, 1967.

one principal attribute. Wiggins derives this view from reflections on identity. In identifying, things are not "the same," but "the same so-and-so." The "so-and-so" can characteristically be a principal attribute. It need be nothing so inflated as extension or thought: the same man, yes, but also, the same radiator.

The details of Wiggins' analysis look very sound to me. One can add, however, that what he calls a "substance-universal" is not determined by any fact of logic, but by the regularities that interest us. This is illustrated by recent discussion of imagined fission and fusion of human beings. Were humans to fission or fuse, what would be the same man? "Man" is a substance universal because it indicates an active principle of unity associated with regularities many of which we understand. If the regularities were to change, "man" might no longer be a substance universal. Substance universals, like substances, indicate those humanly accessible regularities we exploit or guard against.



# LEIBNIZ ON PLENITUDE, RELATIONS, AND THE "REIGN OF LAW"

J AAKKO HINTIKKA

## 1. *Leibniz as a Critic of Descartes*

In January 1680 Leibniz wrote to Philipp as follows: "I esteem Mr. Descartes almost as much as one can esteem any man, and, though there are among his opinions some which seem false to me, and even dangerous, this does not keep me from saying that we owe nearly as much to Galilei and to him in philosophical matters as to the whole of antiquity. At present I recall only one of the . . . dangerous propositions. . . . It is in the *Principles of Philosophy*, Part III, Article 47, in the following words:

And, after all, it makes very little difference what we assume in this respect, because it must later be changed in accordance to the laws of nature. Hardly anything can be assumed from which the same effects cannot be derived, though perhaps with greater trouble. For, due to these laws, matter takes on, successively, all the forms of which it is capable. Therefore if we considered these forms in order, we could eventually arrive at that one which is our present world, so that in this respect no false hypothesis can lead us into error.

I do not believe that a more dangerous proposition than this could be formulated. For if matter takes on, succes-

This essay has been written especially for this volume.

sively, all possible forms, it follows that nothing can be imagined so absurd, so bizarre, so contrary to what we call justice, that it would not have happened and will not some day happen. These are precisely the opinions which Spinoza has expounded more clearly, namely, that justice, beauty, and order are things relative to us but that the perfection of God consists in the magnitude of his activity by virtue of which nothing is possible or conceivable which he does not actually produce. These are also the opinions of Mr. Hobbes, who asserts that everything that is possible is either past or present or future, and that there will be no place for trust in providence if God produces everything and makes no choice among possible beings. Mr. Descartes was careful not to speak so plainly, but he could not keep from revealing his opinions incidentally. . . . In my opinion, this is the 'first falsehood' and the basis of atheistic philosophy, though it always seems to say the most beautiful things about God."<sup>1</sup>

## 2. *The "Principle of Plenitude"*

The thesis Leibniz here brands "the first falsehood and the basis of atheistic philosophy" was not original with Descartes and Hobbes. It is a version of one of the most famous metaphysical principles in Western philosophy and speculative theology, somewhat misleadingly labeled by A. O. Lovejoy the "principle of plenitude." What the principle says is fairly accurately brought out by Leibniz's paraphrase of Hobbes. It says that no genuine possibility can remain unfulfilled through an infinite stretch of time. Other more or less equivalent formulations are: What holds always, holds necessarily; there are no eternal accidents; what never happens, is impossible. The equiva-

<sup>1</sup> C. I. Gerhardt, ed., G. W. *Leibniz: Philosophische Schriften*, 7 vols. (Berlin, 1875-90), vol. 4, pp. 283-84; translation from L. E. Loemker, ed., G. W. *Leibniz: Philosophical Papers and Letters*, Synthese Historical Library (Dordrecht, 1969), p. 273. Hereafter I shall abbreviate these as G. and L., respectively.

lences between these are based on assumptions which are unproblematic for our present purposes. However, the principle has different forms according to how the "genuine possibilities" mentioned in our first formulation are understood. Are they possibilities concerning kinds of individuals? Particular individuals? Kinds of events? Sequences of events? A couple of distinctions between different variants of the principle will be needed later.

Lovejoy studied the history of the principle of plenitude in his famous book *The Great Chain of Being*.<sup>2</sup> As far as the history of philosophy is concerned, however, Lovejoy's work has to be read with considerable caution. It contains important mistakes, and it concentrates largely on one aspect of the principle only, viz., on its role in philosophical and theological ideas of creation and of the perfection of the world.<sup>3</sup>

Leibniz was right about Descartes and Hobbes. The passage he quotes from Descartes is rather inconspicuous, and seems to be partly an insurance against ecclesiastic condemnation. However, we shall see that deeper issues were probably involved in Leibniz's disapproval. As to Hobbes, he assents in so many words to the principle of plenitude in *De Corpore*.<sup>4</sup> Undoubtedly, Leibniz would have found his judgment confirmed if he could have an-

<sup>2</sup> Harvard University Press, 1936.

<sup>3</sup> I have shown in "Necessity, Universality, and Time in Aristotle," *Ajatus*, vol. 20 (1957), pp. 65-90 (also *Philosophy* 106, Bobbs-Merrill Reprints in Philosophy, Indianapolis, 1969) and in "A. O. Lovejoy on Plenitude in Aristotle," *Ajatus*, vol. 29 (1967), pp. 5-11, that Lovejoy was mistaken in denying that Aristotle held the "principle of plenitude." It also appears that Lovejoy was not entirely correct in ascribing the principle to Plato; cf. Erkkä Maula, "Plato or Plenitude," *Ajatus*, vol. 29 (1967), pp. 12-50. These mistakes of Lovejoy's are connected with his preoccupation with the idea of plenitude in the creation of the world. In such a context, Plato—but not Aristotle—might indeed be expected to opt for the principle. The strength of the other ingredients in the "principle of plenitude" is shown by the fact that these expectations turn out to be misleading.

<sup>4</sup> II, 10, iv.

anticipated the use of what he called "the basis of atheistic philosophy" by David Hume in the *Dialogues on Natural Religion*<sup>5</sup> or if he had known of its use by Lucretius in *De rerum natura*.<sup>6</sup> However, it is less obvious what he would have said had he been aware of the acceptance of the principle of plenitude by many—perhaps most—pious scholastics.<sup>7</sup>

### 3. Possibility versus Compossibility

In view of this Protean role of the principle of plenitude in Western philosophy, Leibniz's uncharacteristically violent rejection requires an explanation. Some of his reasons are apparent in our initial quotation. They are connected with his central logical, metaphysical, and theological views. What he emphasizes here is that God has not created all possible beings because then creation would not have been guided by His "striving for the good," i.e., striving for such *desiderata* as order, beauty, and justice. Rather, He has created the best, i.e., the richest, possible world. By the richest world Leibniz means the world containing the greatest variety of jointly possible or compossible individuals (substances).

Leibniz's criticism of Descartes is thus geared to his distinction between possibility and compossibility. Since "not all possibles are compossible,"<sup>8</sup> the viability of this distinction implies the failure of the principle of plenitude, applied to all possible individuals or kinds of individuals. By the same token, Leibniz turns out to have a much more drastic reason than those noted above to hold that God has not created all possible beings. Since they are

<sup>5</sup> Part VII, first paragraph.

<sup>6</sup> Book V, lines 422–30 (cf. Book I, lines 1024–30).

<sup>7</sup> For comments on the history of the principle in the late Middle Ages, see Risto Hilpinen, "Runsauden periaate ja Jumalan mahdollisuudet" (with an English summary), *Ajatus*, vol. 31 (1970).

<sup>8</sup> Leibniz to Louis Bourguet, G., vol. 3, p. 573; L., p. 662.



not compossible, even God could not have done so. This would be a metaphysical (we moderns would say "logical") impossibility which even God is subject to.

Leibniz appears to invest his idea of compossibility with a certain novelty, while admitting that "it may be that Diodorus, Abelard, Wycliffe, and Hobbes had this idea in their heads without completely untangling it."<sup>9</sup> He explains the distinction by identifying the possible with what does not imply a contradiction and by identifying compossibility with the possibility of joint existence.

In view of the crucial role of this notion in Leibniz, it merits a few comments. Critics have occasionally complained that the notion of compossibility does not bring in anything new, but rather relies on the same idea of possibility as the unadorned notion of possibility *simpliciter*. They are of course right in a sense. Using "*M*" for "it is possible that" and otherwise employing an obvious symbolism, the distinction between possibility and compossibility is illustrated by the difference between

$$(1) \quad M(\exists x)Ax \ \& \ M(\exists x)Bx$$

and

$$(2) \quad M((\exists x)Ax \ \& \ (\exists x)Bx).$$

The former is a double assertion of simple possibility: it says that individuals of the kind *A* are possible and that individuals of the kind *B* are also possible. The latter is an assertion of compossibility: it says that individuals of both kinds can co-exist.

The fact that one and the same operator "*M*" can, and must, be used both in (1) and (2) shows that one and only one basic notion of possibility is involved in them. This does not show, however, that Leibniz's distinction is gratuitous. On the contrary, we see from (1)–(2) that what Leibniz has in mind is an instance of the most common, and most important, type of a conceptual distinc-

<sup>9</sup> G., vol. 3, p. 572; L., p. 661.

tion. What distinguishes (1) and (2) is an "operator switch," i.e., the order in which the operations "M" and "&" are applied. Leibniz is thus making a formally correct and interesting point.

This does not, however, answer the question of the importance of Leibniz's distinction. It is not immediately obvious whether, and in what circumstances, (1) and (2) are really different.

#### 4. *Leibniz Needs Relations*

Here modern logic offers us an interesting answer. However "M" can be interpreted, for Leibniz it clearly meant logical possibility (freedom from contradiction). Now if A and B are monadic (non-relational, purely qualitative) predicates, whether complex or not,

$$(3) \quad (\exists x)Ax \ \& \ (\exists x)Bx$$

is satisfiable (logically possible) if and only if  $(\exists x)Ax$  and  $(\exists x)Bx$  are both separately satisfiable (logically possible). In this case, the distinction between (1) and (2) collapses (for logical possibility). In contrast, when A and B are complex in such a way as to contain relational concepts it frequently happens that  $(\exists x)Ax$  and  $(\exists x)Bx$  are both satisfiable while (3) is not. A simple example is the following pair of existential statements:

- (4)           there exists everybody's master;
- (5)           there exists nobody's slave;

where the relations "master" and "slave" are assumed to be converses. There is nothing logically impossible in the truth of either (4) or (5), and yet they are incompatible. This incompatibility may be seen by asking: What is the relation of the individuals mentioned in (4) and (5)? By (4), the former should be the latter's master, which is ruled out by (5).

Thus Leibniz's distinction is without difference as long

as relational concepts are not employed. This is a striking result in view of the often repeated claim that Leibniz wanted to dispense with relations in the last analysis, and to reduce them to non-relational concepts. If this were the case, Leibniz's system would be inconsistent in an ironic manner. His distinction between possibility and compossibility would be a viable one only if his attempted reduction of relations to non-relational predicates fails.<sup>10</sup>

There certainly are passages in Leibniz suggesting such an attempt. The best-known one is probably the following:

You will not, I believe, admit an accident which is in two subjects at once. Thus I hold, as regards relations, that paternity in David is one thing, and filiation in Solomon is another, but the relation common to both is a merely mental thing, of which the modifications of singulars are the foundation.<sup>11</sup>

Benson Mates has offered an interesting though perhaps not entirely conclusive discussion of this passage.<sup>12</sup> The indications concerning Leibniz's intentions that we can garner from his writings are indeed few and far apart. However, what there is seems to point less to a reduction proper of relational *concepts* to non-relational ones than to an attempt to paraphrase relational *statements* (statements saying that a certain relation holds between two or more individuals) in terms of non-relational statements attributing complex predicates (possibly including relations) to these individuals. These predicates, as Mates rightly emphasizes, must not be defined in terms of the other individuals, for that would trivialize everything.

<sup>10</sup> For an earlier statement of this putative criticism of Leibniz, see Nicholas Rescher, *The Philosophy of Leibniz* (Prentice-Hall, 1967), pp. 77-78.

<sup>11</sup> G., vol. 2, p. 486; L., p. 609, translated by B. Mates.

<sup>12</sup> See Mates's paper, "Leibniz on Possible Worlds," in *Logic, Methodology and Philosophy of Science III, Proceedings of the 1967 International Congress*, ed. by B. van Rootselaar and J. F. Staal (Amsterdam, 1968), pp. 507-27, especially pp. 519-21. [See below, pp. 335-64, especially pp. 351-54. HGF.]

### 5. An Explication of *Eo Ipso*

As Mates also points out, Leibniz explicitly mentions an operation by means of which he apparently proposed to effect this paraphrase or reduction. In trying to spell out what Leibniz's intentions amount to, it is thus important to see whether this reductive *eo ipso* operation can be made sense of in systematic terms. Needless to say, this operation cannot be truth-functional. Leibniz explains it only through examples, one of which involves the statement

(6) Paris loves Helen

which he paraphrases as

(7) Paris loves, and by that very fact (*eo ipso*)  
Helen is loved.

An obvious generalization would be to paraphrase *Rab* by

(8)  $(\exists x)Rax, \text{ eo ipso } (\exists y)Ryb$

Mates does not offer any explication of the non-truth-functional operator *eo ipso* occurring here. The problem is to define the operation.

(9)  $P_1(a), \text{ eo ipso } P_2(b)$

for arbitrary (usually complex) predicates  $P_1(x)$ ,  $P_2(x)$  and not just for predicates of the special forms  $(\exists x)Rax$ ,  $(\exists y)Ryb$ .

It may be assumed that, although the complex predicates  $P_1(x)$ ,  $P_2(x)$  may depend on individuals other than  $a$  and  $b$ , they do not depend on  $a$  or  $b$ . (Hence  $P_1(a)$  does not depend on  $b$  nor  $P_2(b)$  on  $a$ .) For simplicity, let us assume that they are of the same depth, i.e., have the same number of layers of quantifiers and that they contain the same free singular terms (apart from  $a$  and  $b$ ). Then they can be represented as a disjunction of conjunctions of the form

$$(10) \quad (\exists x)Ct_{11}(x,a) \ \& \ (\exists x)Ct_{12}(x,a) \ \& \ \dots \\ \& \ (\exists x)Ct_{1i}(x,a) \ \& \ (x)[Ct_{11}(x,a) \\ \vee Ct_{12}(x,a) \ \vee \dots \vee Ct_{1i}(x,a)]$$

$$(11) \quad (\exists x)Ct_{21}(x,b) \ \& \ (\exists x)Ct_{22}(x,b) \ \& \ \dots \\ \& \ (\exists x)Ct_{2j}(x,b) \ \& \ (x)[Ct_{21}(x,b) \\ \vee Ct_{22}(x,b) \ \vee \dots \vee Ct_{2j}(x,b)]$$

respectively. Here the  $Ct_{ij}(x,y)$  are drawn from a certain fixed store of complex predicates, each specifying one kind of individual  $y$  as fully as one can do by means of  $d-1$  layers of quantifiers and by reference to  $x$ .

Now it lies close at hand to say that unless  $i = j = 1$ , the joint truth of (10) and (11) does not *ipso facto* establish any definite relation between  $a$  and  $b$ . Thus the natural definition of (9) will identify it with the disjunction of conjunctions

$$(12) \quad Ct_{11}(b,a) \ \& \ Ct_{21}(a,b)$$

corresponding to pairs of consistent expressions (10), (11) with  $i = j = 1$ .

For any simple two-place relation  $R(x,y)$ , and for many complex ones,  $R(a,b)$  will then be equivalent to (8), as we would undoubtedly like to have it.

In order to have the same result for all complex predicates  $R(x,y)$ , the definition of the *eo ipso* operation will have to be modified somewhat. Instead of the disjunction of all conjunctions corresponding to pairs (10), (11) with  $i = j = 1$ , we may take the disjunction of all conjunctions.

$$(12)^* \quad [Ct_{11}(b,a) \ \vee \ Ct_{12}(b,a) \ \vee \ \dots \\ \vee \ Ct_{1i}(b,a)] \ \& \ [Ct_{21}(a,b) \ \vee \ Ct_{22}(a,b) \\ \vee \ \dots \vee \ Ct_{2j}(b,a)]$$

corresponding with pairs (10), (11) with a *minimal* selection of the  $Ct$ 's in the disjunction representation (distributive normal form) of  $P_1(a)$  and  $P_2(b)$ , respectively. (In other words, there must not be in this representation any consistent disjunct (10) whose  $Ct$ 's are a subset of those of a minimal disjunct.) On this definition,  $R(a,b)$  is in general equivalent to (8).

## 6. Axiom of Reducibility in Leibniz?

Thus we can see—at least in rough outline—the probable logic of Leibniz's attempted reduction—in so far as it can be called a reduction. If what has been said is the whole story, Leibniz was not eliminating relational concepts, but rather relational statements. They can be rewritten by means of the *eo ipso* operation in a subject-predicate form, and usually only with a complex predicate involving relational notions. However, we can still raise the question whether Leibniz perhaps went further and tried to eliminate also relational concepts. Such an elimination presupposes some sort of "axiom of reducibility" (as we can fairly accurately call it à la Bertrand Russell) to the effect that each complex monadic predicate (possibly containing relations) can be reduced to simple (non-relational) predicates. It is difficult to give a definitive answer to this question, and it is not completely certain that an unambiguous answer can be extracted from Leibniz's writings.

Some partial evidence against ascribing such a reducibility assumption to Leibniz may nevertheless be registered here. In a perceptive note,<sup>13</sup> Hidé Ishiguro has argued that Leibniz's theory of space and time (as systems of relations among existents) does not commit him—and was not taken by Leibniz as committing him—to a denial of the reality of spatial and temporal relations. An interesting though inconclusive item of evidence evoked by Miss Ishiguro is the list of simplest terms Leibniz could find.<sup>14</sup> This list includes such relational concepts as "the same," "prior," "posterior," "number," "position," and "place."

In any case, it seems to me that we can understand in a way different from the traditional one (denial of the reality

<sup>13</sup> Hidé Ishiguro, "Leibniz's Denial of the Reality of Space and Time," *Annals of the Japan Association for Philosophy of Science*, vol. 3 (1967), no. 2, pp. 33–36.

<sup>14</sup> See, e.g., G. Grua, G. W. *Leibniz: Textes inédits* (Paris, 1948), vol. 2, p. 542; similar lists are given by Leibniz elsewhere.

of relations) those statements of Leibniz's in which he says that relations are "grounded" on their relata so that there are no "purely extrinsic denominations" (*denominata pure extrinseca*).<sup>15</sup> They can be understood not as denying the reality or the irreducibility of relational concepts, but rather as asserting their indispensability for characterizing individuals (individual substances). On this view, a relation holding between *a* and *b* cannot in the last analysis be purely extrinsic, for the full specification of the individuals *a* and *b* themselves would have to depend on this relationship. In fact, in the passage just referred to, Leibniz explains the denial of purely extrinsic determinations by saying that they are ruled out by "the real connection of all things." A little later he says that "there is no term so absolute or so loose as not to include relations and the perfect analysis of which does not lead to other things and even to all others; so that you can say that relative terms indicate expressly the relations they contain."<sup>16</sup> It is hard to think of a stronger affirmation of the indispensability of relations.

Few philosophers nevertheless seem to have found a satisfactory way of reconciling such statements with Leibniz's apparent denials of the irreducibility of relations. For instance, Nicholas Rescher ascribes to Leibniz the view that all relations among individual substances are reducible to and derivable from the predicates of the respective substances. Rescher acknowledges that these predicates must not be relational in the blatant sense of referring explicitly to other particular individuals.<sup>17</sup> However, he seems to me to miss the correct *via media* here. As we already noted, in his subsequent criticism of Leibniz, Rescher presupposes that all those predicates to which relations are reduced are monadic in the sense of not even containing implicitly relational components. This means overlooking an intermediate position. This position maintains that relational

<sup>15</sup> See *Nouveaux Essais* II, 25, v.

<sup>16</sup> *Nouveaux Essais* II, 25, x.

<sup>17</sup> Rescher, *op. cit.*, p. 74.

statements can be reduced to statements in each of which a complex predicate is ascribed to one and only one of its relata. These complex predicates may still involve relational concepts, although they do not refer to any particular individuals of the universe except the one to which they are attributed.

The main substantial assumption I have to resort to in order to make my interpretation stick is that according to Leibniz the substantial form of an individual substance could, and should, be characterized in terms of quantifiers ranging over all the individual substances. (Of course, it could not be specified by reference to any other particular individual substances.) Obviously, it would be going too far to claim that Leibniz was fully explicit in this matter. Leibniz had neither a terminology nor an explicit logical theory which he could have relied on in making his point. Nevertheless, there are many passages that strongly suggest something like the view just proposed<sup>18</sup> and none that to my knowledge are incompatible with it.

One small but telling piece of evidence for attributing this idea to Leibniz is the locution *ratio generalis ad individuum* which he uses to characterize the complete concept of an individual.<sup>19</sup> It scarcely makes sense unless this complete concept involves generality with respect to individuals, i.e., (speaking with the moderns) involves quantification over other (ultimately, all) individuals.

In some of his most explicit pronouncements on the subject,<sup>20</sup> Leibniz in any case makes it clear that what he terms "a mere ideal thing" is a way of considering relations "without considering which is the antecedent or which the consequent, which the subject and which the object"—that is to say, a way of considering relations not from the point of view of one of the relata but somehow in abstraction

<sup>18</sup> See, e.g., the passages from *Nouveaux Essais* referred to above.

<sup>19</sup> E.g., in his correspondence with Arnauld: see G., vol. 2, p. 54; L., p. 335.

<sup>20</sup> E.g., in his fifth paper to Samuel Clarke, section 47.



from them. There is nothing in such pronouncements to contradict my interpretation, it seems to me.

In his excellent article, Mates attributes to Leibniz an attempted reduction of relations to *simple* properties.<sup>21</sup> I cannot find any mention of the simplicity of those properties which (*apud* Leibniz) constitute the substantial form of an individual substance in the references Mates gives, or for that matter anywhere else in Leibniz. Hence Mates provides no evidence against the point of view I am tentatively proposing here.

It is also salutary to keep in mind that the doctrine of the ideality of relations was almost a commonplace in Leibniz's time and before it.<sup>22</sup> If Leibniz is compared with his predecessors, he will appear much less to stress the unreality of relations than when he is compared with later writers.

Be this as it may, my line of interpretation seems to do much better justice to what Leibniz is actually doing (and saying) than any alternative interpretation I am familiar with. We have already seen how it can in principle be implemented by means of a reconstruction of Leibniz's *eo ipso* operation. It may also be that this interpretation partly vindicates Russell's emphasis on an attempted reduction of all propositions to the subject-predicate form as a source of Leibniz's opinions.

It is not quite clear that even the reducibility of relations to simple properties would necessarily make much difference anyway. Granting the reduction (discussed above) of relational propositions to subject-predicate propositions with a possibly complex predicate containing relations, does it matter much if these relational predicates are reduced further to simple monadic predicates? If these simple properties are somehow necessarily connected with those complex relational properties (complex monadic

<sup>21</sup> See Mates, *op. cit.*, p. 511. [See below, p. 341. HGF.]

<sup>22</sup> See, e.g., Julius Weinberg, *Abstraction, Relation, and Induction: Three Essays in the History of Thought* (Madison and Milwaukee, 1965), pp. 86-119.

predicates) which reduce to them, the reduction makes little difference to the logic of the situation and might merely serve as a device by means of which Leibniz can keep his relational cake as a logician and scientist while eating it as a metaphysician. It may be the case, however, that Leibniz was more consistent than this, though a definitive answer is hard to extract from his writings.

### 7. *Individuals as Reflecting the Whole Universe*

Such clues as we have discovered thus strongly suggest that Leibniz was not trying to reduce relations to non-relational predicates but rather to reduce relational statements to statements in which a complex predicate (possibly involving relations) is attributed to a single subject. The study of such reductions belongs naturally to modern quantification theory. It seems to me that the resources of this theory can in general be brought to bear on Leibniz to an extent larger than philosophers usually realize.

In any case, we can, by means of the results of quantification theory, appreciate one of Leibniz's most characteristic and most puzzling doctrines. This is his idea that each individual substance "reflects" the whole world it belongs to. As a corollary, it follows that according to Leibniz no possible (kind of) individual (i.e., fully characterized individual or individual specified by a complete individual concept) can occur in more than one possible world, for in virtue of this reflection a full specification of this individual will entail a specification of the rest of the world, too.<sup>23</sup> It follows further that two possible individuals (complete individual concepts) are compossible only if they occur in one and the same fully specified possible world.

This doctrine, which *prima facie* may seem rather far-fetched, receives a natural explanation in terms of the

<sup>23</sup> See, e.g., Mates, *op. cit.*, pp. 511-12. [See below, pp. 341-43. HGF.]

distributive normal forms (of first-order logic). Such normal forms are relative to a fixed finite non-logical vocabulary and to a given fixed number of layers of quantifiers, called the "depth" of these normal forms. Any sentence with these characteristics can be transformed into a normal form with the very same "parameters"—or into one with a greater depth, for that matter. Assuming for simplicity that no individual constants and no free individual variables are present, these normal forms are disjunctions of certain mutually exclusive conjunctions called "constituents." A constituent may be thought of as describing a kind of possible world. It does so by specifying what kinds of individuals exist in the world in question. In other words, it is of the form

$$(13) \quad (\exists x)Ct_{i1}(x) \ \& \ (\exists x)Ct_{i2}(x) \ \& \ \dots \ \& \\ (x)[Ct_{i1}(x) \vee Ct_{i2}(x) \vee \dots]$$

where  $Ct_{i1}(x)$ ,  $Ct_{i2}(x)$ ,  $\dots$  is a subset of the set of complex predicates listing all the different kinds of individuals  $x$  specifiable by means of  $d-1$  layers of quantifiers. Each of them is specified by listing, in addition to the monadic predicates  $x$  has, all the different kinds of individuals there exist in relation to  $x$ . These kinds of individuals of course have to be specified by means of  $d-2$  layers of quantifiers. This "relative" list (relative to  $x$ ) of all individuals that there are has to match the "absolute" list (13). The match cannot be a complete one, however, for there are  $d$  layers of quantifiers in (13) and only  $d-1$  in the corresponding relative list. The individual  $x$  in question, we may say in quasi-Leibnizian terms, thus reflects the possible world described by (13) somewhat less clearly than (13) itself. To be precise, it reflects the world down to  $d-1$  layers of quantifiers. Each conjunct  $(\exists x)Ct_{ij}(x)$  occurring in (13) is hence compatible with only one constituent of depth  $d-1$ , the same for all of them. Each possible kind of individual (individual concept) specifiable by means of  $d-1$  layers of quantifiers is thus

compatible with at most one constituent (description of a "possible world") of depth  $d-1$ .

This is already strongly reminiscent of Leibniz. A reason for the difference between the situation we have found in first-order logic and Leibnizian doctrines is also obvious. Our individual concepts have not been fully analyzed, for they are relative to a fixed finite level of analysis (fixed finite depth). Leibniz, in contrast, is considering an idealized situation in which the analysis has been carried *ad infinitum*. In so far as this idealization is legitimate, Leibniz's idea receives in a sense a complete vindication. It is true that there are certain difficulties in the idea of an infinite constituent, which looks like the most straightforward reconstruction of the Leibnizian idealization. However, an infinite sequence of increasingly deeper but mutually compatible constituents—which to all practical purposes amounts to an arbitrary complete first-order theory—is close enough a reconstruction of Leibniz's idea to enable us to say that in this way one of his most characteristic ideas can be vindicated.

To return to Leibniz's idea of compossibility, we can now see how it can also be vindicated. If relational concepts are present, not all possible kinds of individuals are compossible. Unless God is above the laws of logic—which was Descartes's way out—even He could not create a world in which they are all realized. The principle of plenitude is thus bound to fail if the sense of possibility involved in it is logical possibility (freedom from contradiction).

### 8. *The Principle of Plenitude Holds for Compossibility*

It is especially important to appreciate Leibniz's doctrine that a possible individual cannot belong to more than one possible world when one is studying Leibniz's attitude to the principle of plenitude. This doctrine gives us a key to the understanding of several pronouncements in which Leibniz seems to accept the principle, his violent

assertions to the contrary notwithstanding. A case in point is found in the statement<sup>24</sup> *ita dici potest, omne possibile existiturire*. Leibniz is not here saying that all possibilities will be realized, but rather suggesting that every individual that could be realized as a member of that particular selection of possible individuals which characterizes the actual world is realized in it. In other words, Leibniz's *omne possibile* has here something of the force "all compossibilities." As Leibniz says explicitly in his letter to Louis Bourget, "It is very true that what is not, never has been, and never will be is impossible, if we take possible in the sense of the compossible. . . ." <sup>25</sup> Hence the principle of plenitude in a sense holds (*apud* Leibniz) for the notion of compossibility instead of plain possibility, and for it only. In fact, the quoted passage continues (after two lines) as follows: *Verum hinc non sequitur omnia possible existere*. Leibniz even seems to attribute the acceptance of the principle of plenitude to a confusion between possibility and compossibility.<sup>26</sup>

What Rescher calls the "principle of plenitude"<sup>27</sup> is the version which pertains to compossibility rather than to possibility. Since it goes together with the negation of the more common variants of the principle, Rescher's terminology is not without dangers.

### 9. Monads as Reflecting Each Other versus Monads as Windowless

My reconstruction of Leibniz's doctrine that individual substances "reflect" the whole world implies that the existence or non-existence of each possible individual is speci-

<sup>24</sup> G., vol. 7, p. 289. In the *Monadology*, sec. 54, we likewise read: ". . . each possible has a right to claim existence in proportion to the perfection it involves. Thus nothing is entirely arbitrary."

<sup>25</sup> G., vol. 3, p. 572; L., p. 661.

<sup>26</sup> G., vol. 3, pp. 572-73; L., pp. 661-62.

<sup>27</sup> Rescher, *op. cit.*, pp. 50-51.

fied as soon as we have specified the full concept of any one individual existing in the same possible world. This may seem incompatible with those views of Leibniz's which are sometimes expressed by speaking of the "windowlessness" of monads. These views may seem to presuppose that each monad (individual substance) can happily exist no matter what happens to the others.

It is important to notice at once that the typical way in which Leibniz expresses these views is not to say in so many words that monads can exist or fail to exist independently of one another, though occasionally he comes rather close to doing so. Often he says merely that the apparent interaction between a given monad and others can be considered *as if* nothing but this monad and God existed. For instance, in Leibniz's *New System*, he writes that "the perceptions or expressions of external things come into the soul at their appropriate time, in virtue of its own laws, as in a world by itself and as if there existed nothing but God and the soul. . . ." <sup>28</sup> Now such pronouncements may perhaps be taken to suggest that according to Leibniz monads (which include souls) can exist or fail to exist independently of each other. This interpretation cannot be deduced from the texts, however. For instance, the passage just quoted is unashamedly metaphorical, containing both the explicit qualification "as if" and indeed a little later an attribution of the very locution to others. Moreover, such an interpretation is ruled out by Leibniz's explicit doctrine that a monad (individual substance) can exist only in one possible world. For if a monad could exist or fail to exist independently of others, it could exist in different combinations of monads, i.e., in several different possible worlds. This is ruled out by Leibniz in the very same sentence, for he writes there that "each of these substances accurately represents the whole universe in its own way and from a certain point of view." Surely, if any

<sup>28</sup> R. Latta, ed., *Leibniz: The Monadology and Other Philosophical Writings* (Oxford, 1898), p. 313.

of the other monads in the universe were to disappear, the monad in question could no longer express the world as "accurately" as it did before the removal.

It seems to me that the statements in Leibniz's work which have prompted the misinterpretation in question have to be understood as dealing with the interaction of several monads rather than with their possible failure to co-exist. One may perhaps put Leibniz's point by denying not that the concept of each monad involves the existence of all the other monads in its universe, but rather that it involves the *necessary* existence of any other monad, except God. Hence there cannot be any necessitating causal connections between monads.

It is nevertheless only fair to say that this windowlessness doctrine of Leibniz's shows how close he came to being seduced into assuming some kind of "axiom reducibility." This is shown by the fact that in Leibniz the windowlessness of monads is clearly presented as a consequence of their reflecting the whole world. What the latter doctrine amounts to is that any statements concerning the interrelation of two monads can be reformulated in terms of statements attributing certain complex predicates to each of them separately. If these complex predicates could be replaced, in virtue of an "axiom of reducibility," by simple ones (involving no relations), then whatever we can truly say of one monad would be logically independent of what we say of any other, which I take to be the gist of the windowlessness doctrine. The fact that Leibniz always seems to guard his apparent claims that monads can exist independently of each other is nevertheless a good reason for thinking that he never yielded to the temptation, although he seems to do so in giving his readers more picturesque illustrations of his doctrine and although there may have been some obscurity in his own thinking on this point. His own view seems to have been quite clearly that the *eo ipso* reduction is strong enough to support whatever claims of windowlessness he made.

10. *Leibniz's Law—Spurious and Genuine*

An important qualification to what has so far been said is that in a sense the *eo ipso* operation does not effect a genuine reduction of relational propositions to non-relational ones. It may be the case that, given the relational proposition  $R(a,b)$ , propositions  $M_1(a)$  and  $M_2(b)$  can be found such that  $R(a,b)$  is logically equivalent to

$$M_1(a), \text{ eo ipso } M_2(b).$$

From this it does not follow that  $R(a,b)$  should be logically equivalent to the conjunction  $M_1(a) \& M_2(b)$  or for that matter any truth-function of  $M_1(a)$  and  $M_2(b)$ , for any choice whatsoever of the complex monadic propositions  $M_1(a)$ ,  $M_2(b)$ .

It is not hard to see, however, that the idea of individuals as reflecting the whole universe also serves to indicate how a more striking reduction might be possible *apud* Leibniz, provided that his famous assumption of the identity of indiscernibles (the converse of the ill-named "Leibniz's law" of contemporary logic) is also accepted.

Suppose, for the purpose of seeing this, that a pair of (hypothetical) infinitely deep expressions  $D_1(a)$  and  $D_2(b)$  express the full concepts of  $a$  and  $b$ , respectively. Assuming that they are compossible, then in the relative list of  $a$ , as specified by  $D_1(a)$ , there must occur at least one entry—specified, say, by  $(\exists y)Ct_i(a,y)$ —which is compatible with  $b$  in the sense that

$$Ct_i(a,b) \& D_2(b)$$

is consistent ("metaphysically possible").

On one possible construal of Leibniz's identity principle, there will be only one such entry, should  $a$  and  $b$  be actually existing individuals. Then it may be shown that  $D_1(a) \& D_2(b)$  logically implies  $Ct_i(a,b)$ , and vice versa, which gives us the desired reduction.

Here we have operated freely with the fiction of infinitely deep propositions, which need not be justified. However, even so we can gain insight into the structure



of the lines of thought along which a reconstruction of Leibniz's ideas might be looked for.

### 11. *Plenitude and the Widening of the Range of Possibilities*

This does not exhaust the reasons why Leibniz was anxious to deny the principle of plenitude. Another interesting group of reasons was connected with the development of modern science and of scientific method. In this area, Lovejoy's point of view is somewhat one-sided. He discusses this aspect of the history of the principle of plenitude almost exclusively in a cosmological framework. It is to some extent true that the principle played a role in encouraging philosophers and scientists to widen their cosmological perspectives. In order to find room in the actual universe for the many possibilities that the principle asserts to be realized in it, people had to acknowledge the narrowness of their experience as compared with everything there is to be found in the universe.<sup>29</sup>

However, this development seems to have been less important for the history of philosophy proper than Lovejoy's book perhaps suggests, and in any case it was conditional on more basic developments that are largely left untouched by Lovejoy. It is important to realize that the very term "principle of plenitude" is a misnomer. What it asserts is not the plenitude of the actual world but an equation between genuine possibilities and the possibilities realized in the world. This implies the richness of the actual universe only if the range of genuine possibilities is thought of as being fairly extensive. The reason for its adoption can thus be the paucity of genuine possibilities there are to be realized rather than the plenitude of the actually materialized ones. When Lucretius or Aristotle assented to the "principle of plenitude," what they were

<sup>29</sup> Cf. Lovejoy, *op. cit.*, ch. IV.

expressing was as much the paucity of possibilities as the plenitude of their realizations.

This point is closely related to Leibniz's criticism of the principle. "It always seems to say the most beautiful things about God," Leibniz concedes, in that it seems to assert that God in His omnipotence has realized everything that there is to be realized (God as *actus purus*). However, this is to consider the principle in one particular context only, viz., in relation to God's creation of the world. (This is one of the few perspectives in which Lovejoy views the principle of plenitude.) As Leibniz emphasizes, in other conceptual contexts the principle must be viewed in an entirely different light.

The remarkable development during the late Middle Ages and the Renaissance was in the first place the gradual widening of what was thought of as possible. What factors were operative in this development lies beyond the purview of this paper to examine. Duhem and Moody may very well be right in suggesting that theological doctrines concerning God's possibilities encouraged this widening of the scope of what was admitted as possible. The condemnation of 1277 in any case made it *de fide* to assert many possibilities which from the proper Aristotelian point of view were more or less nonsensical.

By and large, this widening of the range of the conceivable discouraged philosophers from believing in the principle of plenitude, rather than encouraging them to assert that the "new" possibilities are somehow, somewhere, sometime realized in our actual world. The first step was to excuse God's possibilities from the scope of the principle, but gradually other possibilities began to follow suit. Philosophers like Bruno—perhaps also Descartes to some extent—who at one and the same time glorified the multiplicity of possibilities and accepted the principle of plenitude, were the exception rather than the rule. No wonder Lovejoy is led to admit that neither Brahe, Kepler, nor Galileo was enthusiastic about the consequences of the principle of plenitude.

Leibniz is poking fun at this type of enthused acceptance of the principle of plenitude when he writes: "It cannot be denied that many stories, especially those we call novels, may be regarded as possible, even if they do not actually take place in this particular sequence of events which God has chosen—unless someone imagines that there are certain poetic regions in the infinite extent of space and time where we might see wandering over the earth King Arthur of Great Britain, Amadis of Gaul, and the fabulous Dietrich von Bern invented by the Germans."<sup>30</sup> Leibniz's criticism has a serious address, however, for he continues: "A famous philosopher of our century does not seem to have been far from such an opinion, for he expressly affirms . . . that matter successively receives all the forms of which it is capable. . . ."

## 12. *The Principle of Plenitude Implies the Failure of All Natural Laws*

But this is not yet the worst. Perhaps the sharpest conflict was between certain forms of the principle of plenitude and the idea of a realistically interpreted science of nature employing general but not analytically (conceptually) true regularities, in short, between the principle and the idea of a law of nature.

In order to see this, let us consider the kind of simple situation inductive logicians like to start from. Let us consider a finite classification scheme for observed—as well as unobserved—individuals. All cells of the partition which go together with the classification scheme are possible to instantiate, and each individual belongs to one and only one of them. Let us assume that we have observed a fairly large number of individuals which are found to belong to certain cells  $Q_1, Q_2, \dots, Q_c$  of the partition, and to leave the rest of the cells  $Q_{c+1}, Q_{c+2}, \dots, Q_k$

<sup>30</sup> Foucher de Careil, *Nouvelles lettres et opuscules inédits de Leibniz* (Paris, 1857), pp. 178–79; L., p. 263.

empty. What can we tell on this basis of the unobserved individuals? What generalization concerning the whole universe can we set up on the basis of our sample? There is no need to discuss these questions here in great detail from the point of view of modern inductive logic. One type of answer merits our special interest, however. It is Carnap's answer or, strictly speaking, the kind of answer found in his published writings so far. It says that in an infinite universe all cells are instantiated with probability one. Therefore the only general law concerning the whole world that one can assert, with any probability however minute, is here the tautological (logically or conceptually true) statement that all our individuals exemplify one of our cells or the other. This is the only generalization one can accept in an infinite universe concerning all the unobserved individuals.

This consequence of Carnap's inductive logic has not remained without its critics. It would nevertheless have won many supporters among earlier philosophers. If the instantiation of each cell is a genuine possibility in the sense appropriate to the principle of plenitude, Carnap's answer is precisely the one prescribed by the principle. If it is possible that a given cell should be non-empty, according to the principle of plenitude there will actually be found an individual in it in the long run.

All the numerous philosophers who in the course of history have assented to the principle of plenitude are therefore in an implicit agreement with Carnap. The most influential of these unwitting supporters of Carnap is undoubtedly Aristotle. His belief in the principle of plenitude is documented in my paper "Necessity, Universality, and Time in Aristotle."<sup>31</sup> Since Aristotle also believed that all genuine knowledge is universal, his acceptance of the principle of plenitude is thus seen to be part and parcel of his belief that all true knowledge is at bottom conceptual, for from the principle it was seen to follow

<sup>31</sup> *Op. cit.*, note 3 above.

(in the simple but representative example just sketched) that the only acceptable universal statements are those that are true for logical (conceptual) reasons. No wonder Aristotelian science is conceptual to the extent it in fact is.

### 13. *Principle of Plenitude and Ockham's Razor. The Crime of Galileo.*

Against this background it is not surprising that Leibniz, who more than perhaps any other philosopher was impressed by the idea of a law of nature, should have objected to the principle of plenitude with its disastrous consequences to any general regularity not holding already in virtue of what Leibniz called "metaphysical necessity." A relatively simple and perhaps a little simple-minded argument against the principle was offered to him by the principle of parsimony ("Ockham's Razor"). In order to see how it can apply here, we only need to recall the classification problem sketched in the preceding section. Surely it is against any conceivable variant of any reasonable parsimony principle to say, after having observed a fairly large number of individuals belonging to relatively few cells, that among the so far unobserved individuals there exist objects belonging to each of the remaining cells, too. A more literal "multiplication of (kinds of) entities without necessity" is hard to think of.

Leibniz, in fact, registers repeatedly the incompatibility of the principle of plenitude with the requirement of parsimony. For instance, see his "Preface to Nizolius"<sup>32</sup> and section 5 of his *Discourse on Metaphysics*.

This is not the whole story, however, of Leibniz's opposition to the principle of plenitude. A political reason which seems to have remained tacit, but of which Leibniz can scarcely have been unaware, was that Galileo was silenced by means of arguments which presupposed the principle. When pressed, Galileo was perfectly willing

<sup>32</sup> G., vol. 4, p. 158; L., p. 128.

to admit that he was only describing how things in fact are, not how God could or could not have made them happen.<sup>33</sup> Yet one of the gravest philosophical and dogmatic mistakes his critics found in his work was that he was "limiting God's power to particular effects," that is, apparently, claiming that things could not happen in any other way. If this charge is to be made to stick, the readily available premise which would make it look respectable is obviously the principle of plenitude. What effect this use of the principle might have had on Leibniz, who was busy trying to have Galileo's works removed from the Index, is easy to guess.

#### 14. *Principle of Plenitude Applied to Sequences of Events*

Leibniz had further methodological and scientific objections to the principle of plenitude, however. This principle is in an especially sharp conflict not just with the idea of a non-conceptual law of nature, but even more so with the idea of a mathematically formulated law of nature. If the dependence of one magnitude on another can be formulated in terms of one particular mathematical function, any other function automatically also represents a conceivable (and hence in a sense possible) mode of dependence. There is no *a priori* reason why freely falling bodies should obey the law  $v = gt$  (velocity proportional to time) rather than, say, the law  $v = gs$  (velocity proportional to the distance fallen), as is vividly brought out by the fact that Galileo initially assumed the latter rather than the former regularity.

If each of these conceivable and hence at least "metaphysically possible" laws is sometimes instantiated, as a sufficiently strong version of the principle of plenitude requires, no mathematically formulated law of nature holds without exceptions. Mathematical physics is in prin-

<sup>33</sup> See G. de Santillana, *The Crime of Galileo* (Chicago, 1955), p. 167.

ciple impossible or at best only approximately or hypothetically true.

Thus we can see why Leibniz the mathematical physicist had as much to object to in the principle of plenitude as Leibniz the metaphysician. No wonder he complained that the Cartesian acceptance of the principle "would obliterate all the beauty of the universe."<sup>34</sup> Elsewhere he speaks likewise of the loss of the order of the universe instead of its beauty.

### 15. Leibniz's Criticism of Descartes Evaluated

In order to bring the weight of the incipient mathematical physics to bear upon the principle of plenitude, Leibniz nevertheless had to change the interpretation of the principle in a natural but interesting way. This tacit shift of ground makes his strong objection to Descartes perhaps slightly less than accurate. As our initial quotation within quotation clearly brings out, in asserting what Leibniz called the "dangerous proposition,"<sup>35</sup> Descartes had primarily in mind possible states of affairs, possible configurations ("forms") of matter, or (as we might also call them in view of the use Descartes makes of them) possible initial conditions. The very same quotation mentions apparently immutable "laws of nature," to which Descartes does not contemplate exceptions. It is the initial conditions that Descartes thinks of as varying, and in fact as being largely arbitrary. This was a rather typical way of looking at the principle of plenitude in the Middle Ages. One of the most characteristic applications of the principle was to temporary configurations of individuals or kinds of individuals, as, e.g., Thomas Aquinas' use of the principle in his *tertia via* illustrates.

Leibniz, in contrast, changes the emphasis of the prin-

<sup>34</sup> Foucher de Careil, *op. cit.*, p. 179; L., p. 263.

<sup>35</sup> Descartes, *Principles* III, art. 47.

ciple from possible individuals, kinds of individuals, or even temporary configurations of individuals to possible sequences of events or of kinds of events. (I wonder whether he is perhaps misinterpreting Descartes's phrase "successively" so as to fit Descartes's words better to his interpretation.) This he does quite explicitly and consistently. For instance in a letter to Coste in 1707, in which he discusses the notions of necessity and contingency, Leibniz discusses how "one fact follows another."<sup>36</sup> Further examples are offered by Couturat,<sup>37</sup> and by the passage quoted above concerning "possible novels."

Again, Leibniz is to some extent reflecting a more general shift of emphasis. The gradual extension of the principle of plenitude to sequences of events tended to discourage philosophers and scientists more and more from holding the principle. According to Anneliese Maier, the beginning of the shift can be placed in the fourteenth century.<sup>38</sup> At that time, the focus of the concepts of possibility and necessity changed from a merely "statistical" comparison of what the state of affairs is at different moments of time to questions concerning the different successions of states of affairs. This change was particularly clear among the Parisian nominalists. It may not be an accident that some of them also seem to have been among the first to dissent explicitly and without qualifications from the principle of plenitude.

It does not seem to be the case, however, that such sequences of events or of states of affairs are what Descartes had in mind in the passage Leibniz quotes. Hence Leibniz's criticism may appear somewhat misplaced. However, in a deeper sense it was probably justified. Cartesian sci-

<sup>36</sup> B. Erdmann, *Leibnitii Opera* (Berlin, 1840), pp. 447-50; P. P. Weiner, *Leibniz Selections*, p. 481.

<sup>37</sup> Couturat, *Opuscles et Fragments*, pp. 529-30; L., pp. 168-69.

<sup>38</sup> See Anneliese Maier, *Die Vorläufer Galileis im 14. Jahrhundert: Studien zur Naturphilosophie der Spätscholastik* (Rome, 1949), ch. 8.



ence was conceptual for reasons not unrelated to the principle. One of the clearest statements to this effect occurs in the corollary to Proposition III of the "Arguments drawn up in geometrical fashion" which Descartes appended to his reply to the second set of objections to the *Meditations*: "But we possess the idea of a power so great that by Him, and Him alone, in whom this power is found, must heaven and earth be created, and a power such that likewise whatever else is apprehended by me as possible must be created by Him too." (Cf. also Descartes's reply to the sixth set of objections, sec. 6.)<sup>39</sup> Leibniz was therefore right in attributing a form of the principle of plenitude to Descartes. To what extent Descartes conceived of it in the same way as Leibniz did remains unclear.

Leibniz's criticism of Descartes is somewhat inaccurate in another respect, too. He clearly assumes that Descartes should have applied his version of the principle of plenitude to God's possibilities ("nothing is possible or conceivable which he does not actually produce"). Yet Descartes in so many words denied such applicability, although Leibniz probably was unaware of the most explicit instances of such denials. (A case in point is found in Descartes's letter to Father Mesland, May 2, 1644.) Even so, Leibniz could have accused—and indeed did accuse—the Cartesian God of arbitrariness. Maybe it is after

<sup>39</sup> Norman Malcolm has called my attention to the fact that this piece of evidence is somewhat ambiguous. I quoted the translation of E. Haldane and G. T. R. Ross who follow the French version of Descartes's replies. The Latin version, however, says only that whatever is apprehended by me as possible, God *can* create. Of course, the two versions are equivalent precisely when the principle of plenitude is being presupposed.

It looks as if Descartes restricted the principle of plenitude to general possibilities concerning the material world. Thus Descartes writes in the Sixth Meditation, ". . . we must at least admit that all things which I conceive in [corporeal things] clearly and distinctly, that is to say, all things which . . . are comprehended in the object of pure mathematics are truly to be recognized as external objects." Here Descartes infers *truths* about external objects from their *possibility* (clear and distinct conceivability).

all a good *argumentum ad hominem* for Leibniz to argue against Descartes not on the basis of God's incapacity of realizing all possibles, but rather on the basis of the resulting disorder, arbitrariness, and injustice.

We already saw in fact that the one important aspect of Leibniz's criticism of Descartes was directed against what we would call the conceptual character of Cartesian sciences. This Cartesian conceptualism turned on an application of the principle of plenitude to what is humanly conceivable ("clearly and distinctly"), not on an application to God's possibilities. In this direction, the edge of Leibniz's criticism is not dulled by the qualification just made.

### 16. *Logical Necessity versus Natural Necessity*

Throughout much of the discussion above, a critical reader may have missed an important distinction. What we have been considering appears to have been logical possibility only. Should we not have discussed natural or physical possibility instead of the purely logical one? The answer is twofold. For one thing, many of Leibniz's formulations (such as those in terms of freedom from contradiction, conceivability, etc.) clearly refer to logical rather than physical possibility (from our point of view), as does much of the phraseology of his predecessors. For another, no sharp and unequivocal distinction between logical and natural necessity and possibility is likely to be found in most of Leibniz's predecessors. Rather, the purposes which this distinction serves were partly catered to by some suitable derivative distinction between absolute and relative possibility. (Both these notions presuppose the same sense of possibility.) I have argued for this earlier in the case of Aristotle,<sup>40</sup> and somewhat similar remarks apply to many of his medieval successors. In

<sup>40</sup> Jaakko Hintikka, "Aristotelian Infinity," *Philosophical Review*, vol. 75 (1966), pp. 197-219.

fact, it is the gradual weakening of the principle of plenitude that tends to make indispensable a distinction between logical and natural necessity. In Leibniz, no such distinction is usually made in an explicit form, although his distinction between what is true in virtue of metaphysical necessity and what is true in virtue of the principle of sufficient reason (or of the principle of perfection) is perhaps something of an approximation to it. Such distinctions are occasionally assimilated by Leibniz to the distinction between absolute and hypothetical necessity.<sup>41</sup>

In a brief note, "De rerum originatione radicali," Leibniz operates in so many words with a distinction between "metaphysical" and "physical" necessity.<sup>42</sup> The two are not unrelated to each other, however, for Leibniz says that "we now have a physical necessity derived from a metaphysical one," and in so many words identifies physical with hypothetical and metaphysical with absolute necessity.

Leibniz is thus seen to stick to the letter of the traditional view. Yet he is unwittingly preparing the ground for breaking the tradition. The traditional idea of a hypothetical necessity was necessity relative to certain times or relative to occasions on which certain conditions are satisfied. For Leibniz, the hypothetical or physical necessity of those natural laws which in fact hold is conditional necessity relative to the assumption of our world's being perfect, the "best possible world."<sup>43</sup> This assumption was for Leibniz guaranteed by God's goodness, omniscience, and omnipotence—and of course also by His existence. Knock out these theological underpinnings, and the Leibnizian tie between metaphysical (logical) necessity and the physical necessity of actually holding natural laws disappears.

<sup>41</sup> See, e.g., Leibniz's fifth paper against Clarke, sections 4-6; *Discourse on Metaphysics*, section XIII.

<sup>42</sup> G., vol. 7, p. 304; L., pp. 487-88.

<sup>43</sup> Cf. G., vol. 7, p. 304.

Although no clear distinction between logical and physical necessity thus emerges from Leibniz's writings, his contrast between metaphysical and moral necessity nevertheless seems to have constituted a strong impetus towards developing such a distinction.

### 17. "The Reign of Law" in Modern Logic and in Leibniz

For one more important aspect of Leibniz's ideas we must return to the classificatory situation discussed above. As the perceptive reader has undoubtedly noticed already, it seems to belie Leibniz's idea that the richest possible selection of compossibles is realized in the actual world. For clearly the existence of one kind of individual does not preclude the realization of any other. Thus the richest selection of compossibles is the one in which each cell is exemplified. Hence we seem to have reduced Leibniz, if not *ad absurdum*, at least *ad Aristotelem et Carnapium*. However, saying this is but to repeat what we said above to the effect that Leibniz's ideas can only be done justice to when relations are present. What happens then in modern logic in fact beautifully confirms Leibniz's ideas, as ably summed up by Russell. Earlier, I pointed out that in the relational case the distinction between possibility and compossibility is indispensable: not all possibles can be realized in one and the same universe. Now we can see another doctrine of Leibniz's vindicated. In the non-relational case, no purely universal laws (universal statements) are true in an Aristotelian (or Carnapian) world except those that are logically true. In contrast to this, if relations are present, there holds in each universe at least one "general law" of the form

$$(14) \quad (x) [Ct_{i1}(x) \vee Ct_{i2}(x) \vee \dots]$$

(cf. Section 8 above for the notation) which is not true for purely logical (conceptual) reasons. (In order to see this, let  $Ct_{i1}(x)$ ,  $Ct_{i2}(x)$ , . . . be simply all those kinds

of individuals, in the sense of Section 7 above, that are exemplified in the universe in question. By what was just said, they cannot comprise all such kinds of individuals.)

Thus each possible world is characterized (at each given finite depth) by the strongest "general law" (in the sense of a statement of form (14)) true in it. This is, as Russell says, what Leibniz's idea of the "reign of law" really amounts to.<sup>44</sup> Because of this, Leibniz can say that God's choice between different possible worlds is really a choice between the different over-all laws governing these worlds. "There is an infinity of possible ways in which God could form, and . . . each possible world depends on certain principal designs or purposes of God which are distinctive of it, that is, certain primary free decrees (conceived *sub ratione possibilitatis*) or certain laws of the general order of this possible universe with which they are in accord and whose concept they determine, as they do also the concepts of all the individual substances which must enter into this same universe. Everything belongs to an order . . ."<sup>45</sup>

If the universe in question contains, moreover, a maximally rich selection of compossibles, we have precisely the kind of situation Leibniz envisaged. Although there is no logical ("metaphysical") necessity that precisely this collection of compossibles should have been realized, and although many other kinds of individuals could have been realized, it is nevertheless true in our contemporary logic—even when we restrict ourselves to what can be expressed at some given fixed depth—that no other kind of individual (specifiable by means of expressions of this fixed depth) could have been instantiated, given the instantiation of all actually existing individuals. Leibniz's adherence to the principle of plenitude for compossibles is thus justified, given his general metaphysical outlook.

<sup>44</sup> A *Critical Exposition of the Philosophy of Leibniz* (London, 1937), p. 67.

<sup>45</sup> G., vol. 2, p. 51; L., p. 511.

18. *Plenitude and Reciprocity*

There is at least one more context in which Leibniz was (wittingly or unwittingly) confronted with the principle of plenitude. This happened in formal logic, where Leibniz was led to consider the interrelations of the so-called intensional and extensional points of view. (He called them *methodus per notiones et per individua*.) Here the principle of plenitude is equivalent to what is sometimes called the "law of reciprocity": relations of concept inclusion are inversely mirrored by the extensions of the concepts in question. For if the addition of a new element  $E$  to concept  $T$  makes a difference, so that it is possible that an individual should exemplify  $T$  but not  $E + T$ , then it would follow from the principle of plenitude that this possibility is sometimes realized, i.e., the extension of  $E + T$  is a proper subset of the extension of  $T$ .

Leibniz apparently came upon the reciprocity law first in a purely logical context<sup>46</sup> and overlooked the problems connected with it. Later, he became aware of some of the problems, although I have not found any explicit statement by him where the particular difficulties he discusses are related to the other repugnant consequences of the principle of plenitude or to the principle itself. The difficulties Leibniz discusses still belong primarily to technical logic.<sup>47</sup> Perhaps it is nevertheless significant that in this area, too, Leibniz eventually opposed the consequences of the Aristotelian and Cartesian principle of plenitude.

In any case, Leibniz could not have taken the easy way out which some of his commentators have prescribed. He would not have tried to save the reciprocity law by in-

<sup>46</sup> See, e.g., Couturat, *Opuscles et Fragments*, p. 235; R. Kauppi, *Über die Leibnizsche Logik* (Helsinki, 1960), p. 45.

<sup>47</sup> See, e.g., G., vol. 7, pp. 211–17; G. H. R. Parkinson, *Leibniz: Logical Papers* (Oxford, 1966), pp. 115–21.

cluding "possible individuals" within the extensions of the concepts so as to instantiate all the requisite classes. It is true that he mentions (in the paper on "some logical difficulties" just referred to) "supposed men" (*homines suppositi*) serving purposes closely related to the reciprocity law. But they cannot save the law, for Leibniz realized clearly himself that not all possible kinds of individuals are compossible. No conceivable universe could therefore offer us a set of individuals from which all the necessary extensions can be carved, and the use of "possible individuals" is reduced to well-deserved absurdity.

### 19. *An Inconclusive Conclusion: Logic and Metaphysics in Leibniz*

If there is a general conclusion to our observations, it surely is a reaffirmation of Bertrand Russell's thesis that Leibniz's philosophical doctrines were heavily conditioned by his logical insights. In fact, this dependency cuts deeper than Russell himself and other commentators have so far brought out.

It may also be of some interest to see the kind of logic we have been relying on: ordinary quantification theory plus a touch of inductive logic. Modal logic (intensional logic) has not been essentially resorted to.

I suspect that in so far as Leibniz can truly be said to have preferred the "intensional point of view" in his logical theorizing, his reasons are essentially connected with the rejection of the principle of plenitude.<sup>48</sup> If so, we

<sup>48</sup> As I have pointed out in my earlier paper, "Necessity, Universality, and Time in Aristotle", *Ajatus*, vol. 20 (1957), pp. 65-90, it even is a little surprising to see a believer in plenitude develop a modal logic. This surprise is occasioned by the fact that for such a philosopher necessity is at least materially equivalent with omnitemporal truth and possibility with sometime truth. Hence for him the modal element is simply tantamount to quantification over time. Ordinary extensional logic (quantification theory) seems to be all he needs. Only when the principle of

also see how gratuitous the contrast between the two points of view is. No modern logician has dreamt of reviving the principle of plenitude, and yet there has been no general need whatsoever to drag intensions or possible individuals into discussions of syllogistic or other parts of first-order logic.

What emerges from our discussion is therefore an almost ironic observation. Tremendous though Leibniz's contributions to logic were, they did not even come close to spelling out the (to my mind even more impressive) logical (structural) insights on which his metaphysics was based. The most important secret of modern logic is not its symbolism, but the general concept of quantification. This was left by Leibniz for Gottlob Frege to spell out, although some of his own basic insights were, at bottom, quantificational.<sup>49</sup>

---

plenitude is given up is one driven to a sharp distinction between modal and non-modal logic.

<sup>49</sup> For valuable comments on and criticisms of earlier versions of this paper I am indebted to Professors Raili Kauppi and Risto Hilpinen, as well as to Dr. Lauri Routila.



# LEIBNIZ'S THEORY OF THE IDEALITY OF RELATIONS

HIDÉ ISHIGURO

Leibniz's theory of the ideality of relations is one of the most misunderstood of all his controversial doctrines.<sup>1</sup> What Professor Nicholas Rescher has written about the reducibility of relations in his recent book on Leibniz,<sup>2</sup> although a great improvement on what Bertrand Russell claimed in his influential book more than sixty years earlier,<sup>3</sup> seems misleading.

Rescher is quite right when he says that by denying reality to relations Leibniz never meant that statements asserting relations between objects were meaningless, or that such statements were always false because there are no relations between objects. On the contrary, Leibniz at-

This essay has been written especially for this volume.

<sup>1</sup> Since I wrote the original draft of this paper in late 1967, I have profited from criticism from the members of the Philosophy Societies of the University of East Anglia, the University College of Wales at North Bangor, the University of Leeds, and especially from the members of a graduate seminar at Cornell University in autumn 1969. In early 1970 Professor Jaakko Hintikka sent me his article "Leibniz on Plenitude, Relations, and the 'Reign of Law,'" which I realize covers much of the same ground as my paper.

<sup>2</sup> Nicholas Rescher, *The Philosophy of Leibniz*, Prentice-Hall, 1967, ch. 6.

<sup>3</sup> Bertrand Russell, *A Critical Exposition of the Philosophy of Leibniz*, Cambridge University Press, 1900.

tached great importance to relational propositions, as was only natural for a philosopher who was also an outstanding mathematician. After all, mathematics contains many relational propositions; and Leibniz intended to extend traditional logic so that it would include a calculus of relations—a logical calculus which would account for the special entailments that held between relational propositions. But what then did he mean by claiming that relations were ideal or mere “beings of reason”? And what was his contention in asserting that there was “no purely extrinsic denomination”?

According to Rescher, Leibniz’s claim amounts to the assertion that “all relations that obtain among individual substances are reducible.” This is to say that “the only relations which hold among substances are those that are reducible in the sense of inhering in predications about the substances at issue.”<sup>4</sup> Rescher does not make clear what he means by “predications,” but it seems to mean that reality would be completely describable not only without referring to relations, but also without using any relation-words or any non-monadic predicates at all. But what precisely should one understand by “predication”? To say that it is the ascription of a property to an individual in a proposition with a subject-predicate form begs the question of what constitutes a subject-predicate form. Must there only be one subject in a proposition of the subject-predicate form? And do all predicates in propositions of subject-predicate form (whatever that may be) ascribe non-relational properties to things? “Peter has good health” has the form of a relational sentence whose two terms are “Peter” and “good health,” but the fact it states is no more relational than what would be stated by “John is healthy.”

Leibniz realized that it is no easy matter to decide when a property ascribed to a thing involves a relation’s holding or not. In the *New Essays* he casts doubt on the distinc-

<sup>4</sup> Rescher, *op. cit.*, p. 75.

tion of relative terms and absolute terms which John Locke had employed in his *Essay Concerning Human Understanding*. According to Locke, words like "black" or "merry" are absolute words since when we denote a man by, e.g., the word "black," "we neither signify nor intimate anything but what does or is supposed really to exist in the man thus denominated." In contrast to this, words like "father" or "merrier" are relative, since the words "together with the thing they denominate, imply also something else separate and exterior to the existence of that thing."<sup>5</sup> Thus a father is a father *of someone*, a person who is merrier is merrier *than someone else*.

Locke realized, therefore, that some words which can occur in a predicate's position ascribe relational properties to the subject. Leibniz goes even further and says that one cannot strictly distinguish between properties which involve relations and properties which do not. On the one hand Leibniz believed that there "can be no purely extrinsic denomination,"<sup>6</sup> i.e., there can be no way of identifying things by extrinsic relational properties which do not involve some intrinsic property of the thing. But on the other hand he believed that "there is no term (concept) so absolute or so detached as not to include relations, and the perfect analysis of which does not lead to

<sup>5</sup> John Locke, *Essay Concerning Human Understanding*, Book II, Chapter 25, §10.

<sup>6</sup> Leibniz does not define either "denomination," "intrinsic," or "extrinsic," but he obviously used "denomination" as medieval logicians did, which is close to what Aristotle meant by "paronymy" in *Categories*, chs. I and VIII. (See N. Kretzmann, "History of Semantics," in *Encyclopedia of Philosophy*, ed. by P. Edwards, vol. 7, p. 365.) Anselm in *De Grammatico* uses "denominate" to mean the appellation of an object by an expression derived from a word which refers to a quality the object has. "Intrinsic denomination" would then be an identification of an object by a word which refers to an intrinsic property an object has, and "extrinsic denomination" an identification of an object by an expression which refers to an extrinsic property like place or quantity of the object. Leibniz gives as examples of the latter demonstratives like "this" or "that."

other things and even to all others.”<sup>7</sup> If every predicate expresses a concept involving relational as well as intrinsic properties, then the only distinction which can count for Leibniz is whether a predicate refers to a relation explicitly or implicitly. The truth of every subject-predicate proposition involves the holding of some relation or other. That we do not use a proposition which is relational in its syntactical form (i.e., one which can be seen as including a relational expression, i.e., an open sentence with more than two free variables) is no guarantee at all that we are *not* ascribing a relational property to a thing.

It is understandable, then, that Leibniz did not believe, as I will later show, that one can achieve a complete description of a substance without referring to its relational properties. Even if we do not refer to a relational property explicitly, we do so covertly. That substances stand in various relations to each other in our universe is neither a fantasy nor a fiction, but an ineradicable fact. The totality of the truths about a substance cannot omit the truths of all such facts about it.

What then is Leibniz’s thesis about the ideality of relations? I will try to disentangle five separate theses which I shall expound in turn. I shall then discuss their mutual relationships. The first, which I will call the “presupposition thesis,” asserts that things cannot stand in a relation to each other without having non-relational properties. This is most clearly expressed in a fragment in which Leibniz says: “. . . the category of relations such as quantity and position do not constitute intrinsic [non-relational] denominations themselves, and, what is more, they need

<sup>7</sup> *New Essays*, Book II, ch. 25, section 10. That what Leibniz means by “term” is *concept* is seen from the following passages: “Per Terminum non intelligo nomen sed conceptum seu id quod nomine significatur, possis et dicere notionem, ideam” (L. Couturat, *Opusculs et fragments inédits de Leibniz*, p. 243); “. . . et ita distinguenden erit inter terminum et rem seu ens” (*ibid.*, p. 393).

a basis taken from the category of quality, or intrinsic denomination of accidents." (. . . *quae ipsae per se nullam denominationem intrinsicam constituent adeoque esse relationes tantum quae indigeant fundamento sumto ex praedicamento qualitatis seu denominatione intrinseca accidentali.*)<sup>8</sup> This argument reminds us of a similar one which Leibniz uses against Descartes's theory that the essence of matter is extension. Leibniz thinks there is a conceptual inadequacy about such a theory. We must ask ourselves what it is that is extended. "Besides extension there must be an object which is extended."<sup>9</sup> And Leibniz is right here, since it may be more the nature of the "that" which is extended than the fact that it is extended which distinguishes matter. We can say of a table that the table is extended, that its surface is extended, that the color has extension—but we would not want to say that there are three or more material substances equally extended. It is not merely the applicability of the property *extended* that defines matter for us. So long as we can talk of extensions, we are identifying *something* which is extended. Similarly, Leibniz thought that if we locate something we must "ask ourselves what it is that occupies the place."<sup>10</sup> The presupposition thesis is then that things cannot stand in relations to each other without themselves having non-relational properties.

Leibniz sometimes seems to confuse this thesis with a somewhat stronger claim which one might call the thesis that individuation (what distinguishes one thing from another) is based on non-relational properties of things. This is the second thesis. He writes, for example:

It is always necessary that besides the difference of time and space there be an internal principle of distinction . . . thus although time and place (that is

<sup>8</sup> Couturat, *Opuscles et manuscrits inédits de Leibniz*, p. 9.

<sup>9</sup> Letter to the editor of *Journal des Savants*, June 1691 (Gerhardt, *Philosophischen Schriften* IV, p. 467).

<sup>10</sup> Letter to J. Ch. Scheilenburg, 17 May 1698 (Gerhardt, *Mathematischen Schriften* VII, p. 242).

to say the relation they have to external things) serve us in distinguishing things which we do not easily distinguish by themselves, the things do not cease to be distinguishable in themselves. The essence of identity and diversity consists, then, not in time and place, although it is true that the diversity of things is accompanied by that of time or place . . .

[*New Essays*, Bk. II, ch. 27]

It is not easy to make clear what Leibniz means by this claim. He is not merely stating the presupposition thesis—that if we claim that *A* and *B* are at different places at a given time, then we must be able to claim also that *A* and *B* have each a set of properties which do not carry reference to place and time. He is also saying that, although we may use relational properties such as location to tell *A* and *B* apart, the set of non-relational properties which *A* and *B* have is adequate to distinguish *A* from *B*. He writes, for example:

It is not possible that two things should differ from each other only in the place and time (they occupy). But it is always necessary that some other internal distinguishing characteristic is there.<sup>11</sup>

It is important all the same to realize that Leibniz never excluded the possibility of these internal distinguishing characteristics themselves being consequential upon, or being related to, the spatial position that *A* and *B* have at a particular time, or founded in the truth of various spatial and temporal relations holding between *A* or *B* and all the other things in the universe, including the relations which hold between *A* and *B* themselves. Nor does he exclude the possibility of these characteristics being “relational properties” in the loose sense given in the beginning of this paper. Indeed, for Leibniz every concept is relational in this sense. For example, Leibniz believed that the intrinsic feature of a mind is its successive states of awareness or perceptions and its desires; but he never

<sup>11</sup> Couturat, *Opuscles et fragments inédits de Leibniz*, p. 8.

claims that perceptions are not consequences of the mind's standing to other things in the universe in a certain way. Thus every characterization of a thing would of necessity invoke relational properties of that thing.

The doctrine of the existence of internal characteristics which individuate things, then, is in my interpretation equivalent to a third thesis of Leibniz's about relations. It could be called the "mirror thesis." According to Leibniz, every individual "expresses" or mirrors the whole universe from its point of view.<sup>12</sup> So long as there is more than one individual in a given universe, truths about any individual which we may describe by monadic predicates (such as the properties of the perceptions of the individual or the desires he has) are inseparable from the relational properties that are true of the individual, e.g., that it is closer to A than B and so on. Relational properties and non-relational properties are thus intrinsically bound up with one another. That is why, as I have pointed out above, Leibniz believed that there is no concept which is "so detached," i.e., which is a property that involves only one object in total isolation. Every concept must involve relations and lead us from the subject to other things with which the subject is related. Thus, when Leibniz claims that the concept of an individual substance includes all the predicates which are true of the individual, the predicates explicitly or implicitly carry reference to all the other things in the world to which the individual belongs. This means that the predicates include those which ascribe relational properties to the individual. Leibniz writes in a letter to Arnauld:

I say that the concept of an individual substance involves all its changes and all its relations, even those which are commonly called extrinsic, that is to say, which pertain to it only by virtue of the general interconnection of things, and in so far as it expresses the whole universe in its own way . . . [14 July 1686]

<sup>12</sup> *Discourse on Metaphysics*, 14, 26, 33; *Monadology*, 62.

Thus Leibniz's often quoted claim that the concept of an individual substance is "sufficient for the understanding of it and for the deduction of all the predicates of which the substance is or may become the subject"<sup>13</sup> should not be taken to mean that an individual concept consists of a set of non-relational attributes from which one can derive all predicates including relational ones that are true of the individual. It is rather that for any true predicate, including relational ones, "the content of the subject must include that of the predicate in such a way that if one understands perfectly the concept of the subject, he will know that the predicate appertains to it."<sup>14</sup> In other words, all true relational predicates of an individual can be drawn out of the concept of the individual because they are already parts of it, not because one can derive them from different predicates which make up the concept. Every open sentence with one free variable, which could express a true proposition when a name of an individual is put in the variable place, corresponds to a predicate of the individual. Some of the predicates which have logical forms like  $xRa$  or  $(\exists y)xRy$  are monadic predicates but nevertheless ascribe relational properties to the subject. This is the reason why it is extremely difficult to say of a *proposition* whether it is a relational one or not. A proposition of the form  $Rab$  can be seen as obtained from giving an argument to  $x$  in  $Rxb$  or from giving the arguments  $a$  and  $b$  in  $Rxy$ . But whether we treat the proposition as having one subject or two subjects, we can at least agree that the property ascribed to either one or two of the subjects holds only if a relational fact obtains, and in that sense the proposition can be said to be relational.

Leibniz, like Gottlob Frege, thought that a sentence may have many different logical analyses. In a letter to Samuel Clarke, which I will quote later, Leibniz explicitly says of a sentence of the form  $mRl$  that one can take it as ascribing "the accident which philosophers call relation"

<sup>13</sup> *Discourse on Metaphysics*, 8.

<sup>14</sup> *Ibid.*



either to *m* or to *l*. *m* is the subject of the accident *Rl* and *l* is the subject of the accident *mR*. Similarly, the sentence

David is the father of Solomon

can be regarded as ascribing a relational property to David or to Solomon.<sup>15</sup>

This mirror thesis, then, is quite different from Rescher's claim about the reducibility of relations, which, judging from his examples, seems to mean that any truths of relational facts can be replaced by a set of non-relational properties of the things which stand in the relation. In support of his claim, Rescher refers in a footnote to the following passage from Leibniz:

Thus I hold, as regards relations, that paternity in David is one thing and filiation in Solomon another,

<sup>15</sup> Benson Mates writes, in his interesting paper "Leibniz on Possible Worlds" (1968), that Leibniz was "not content to take the trivial way out that just rereads or redescribes the sentence, 'David is the father of Solomon,' for example, as ascribing the attribute 'father of Solomon' to David and the attribute 'having David as father' to Solomon; it is clear, to use some more recent terminology, that he would not be inclined to accept every open sentence with one free variable as expressing an attribute." But it is far from clear whether Leibniz would refuse to accept that every open sentence with one free variable expresses an attribute. Leibniz's explanation of what an attribute is is often confused. But whatever their shortcomings, the explanations are generally more syntactical than metaphysical in nature. E.g.,

An attribute is the predicate in a universal affirmative proposition (of which the subject is the name of a thing).

(Couturat, *Opuscules et fragments inédits*, p. 241)

In the *New Essays* Leibniz does attempt to make a distinction between attributes and modifications in a non-syntactical way. Here Leibniz seems to mean by "attribute" faculties or capacities of things. Thus the capacity to perceive is said to be an attribute while perceptual states are said to be modifications. But this is a question of terminology. For, whatever Leibniz thinks is the distinction between attributes and modification, it is clear that for him relational predicates—open sentences which contain quantifiers which range over individual objects and which express the relation a thing has to something else—are considered as constituting the description of the individual concept of the thing.

but the relation common to both is a mere mental thing, of which the modifications of singulars are the foundation.

[Gerhardt, *Phil.*<sup>1</sup> II, p. 486]

This is a strange thing for Rescher to do, since neither paternity nor filiation are non-relational properties in any straightforward sense. Rescher comments parenthetically that Leibniz would have rejoiced over recent discoveries in the field of genetic coding. But even if a child's genes are entirely determined by those of his parents, the child's having that particular set of genes is not what we mean by ascribing "filiation" to him. We mean that he was born of a certain woman who conceived him by a certain man—which are all relational properties. It is true that by ascribing paternity to David we do not identify any child whose father David is—we are saying that there is a person X such that David is the father of X. But in the sense in which the property ascribed to the subject holds if and only if the subject stands in a certain relation to another object (which is the sense in which Leibniz claimed that all terms are relative), the property is a relational one. That is to say, although a predicate like "is a father" can be treated as a monadic predicate, it conceals a bound variable, and its sense depends on there being a two-place predicate "x is the father of y."<sup>16</sup> We have already seen that some monadic predicates ascribe relational properties. Monadic predicates which conceal a bound variable most clearly express relational properties. No reduction to non-relational properties has been carried out here. What Leibniz is contrasting the relational properties with is not a non-relational property but an ideal entity called "relation."

This brings me to the fourth Leibnizian thesis about relations, which I will call the "nominalist thesis." It is

<sup>16</sup> In Russell's language in *Principia Mathematica*, it is indeed obtained from the function "x is the father of y" by turning some of the arguments to the function into apparent (i.e., bound) variables.

the thesis that our notion of relation is an abstraction from the relational properties, or the mutual connections of things, just as our notion of color is an abstraction from colored things. Relations are abstract entities made by abstraction out of things being "in situation" with one another. Again Leibniz argues his case in some detail with reference to the notion of place. How do we refer to and individuate places? According to Leibniz:

They consider that many things exist at once and observe in them a certain order or co-existence. . . . When it happens that one of the co-existent things changes its relation to a multitude of others which do not change their relation among themselves; and that one thing, newly come, acquires the same relation to the others as the former had; we then say it is come into the place of the former.

[Leibniz-Clarke Correspondence, 5th letter]

And that which comprehends all those places is called space, which shows, that in order to have an idea of place and consequently of space, it is sufficient to consider these relations and the rules of the changes without needing to fancy any absolute reality outside the things whose situation we consider.

[*Ibid.*]

Thus the concept of place of an individual spatial locus, and in general any concept of relation, is obtained by abstraction from consideration of things having certain relational properties to each other. When one refers to a relation, one is referring to an abstract entity—to what Leibniz calls *ens rationis*. By talking of these "beings of reason," one is not necessarily talking of fictitious objects like centaurs or arbitrarily constructed objects.

Although relations are of the understanding, they are not groundless or unreal. For the divine understanding is the origin of things and even the reality of all things, simple substances excepted, consists in the

basis of the perception of the phenomena of simple substances.

[*New Essays*, Bk., II, ch. 13]

Leibniz even writes that he would prefer to call an impossible fictitious object *être de raison non raisonnante*.<sup>17</sup> But relations are mental constructions all the same and can be given a contextual definition; sentences referring to them can be reduced to sentences in which individual constants only refer to substances.

For Leibniz, what really exist as basic constituents of the world are individual substances. Anything else which we refer to when talking of the world, whether relations or colors, are only our abstractions from the fact that things or the phenomena we perceive have these properties. According to Leibniz, the nominalists (following Ockham) have "deduced the rule that everything in the world can be explained without any reference to universals and real forms," and Leibniz agrees that "nothing is truer than this opinion."<sup>18</sup> "For concrete things are really things, abstractions are not things but modes of things. Modes are usually nothing but the relation of a thing to the understanding."<sup>19</sup> Thus, when we refer to relations, as when, according to Leibniz, we refer to places or to ratios, we are referring to *entia rationis*. (He thought that "numbers, unities, fractions" also depended on the mind for their existence and thus had "the nature of relations.") This holds of every relation and not, as Professor Gottfried Martin has suggested, primarily of certain relations which have been arbitrarily determined by human thought.<sup>20</sup> For although Leibniz distinguished between relations which hold between things because of the regularity of nature and relations which come about by convention or agreement like that which holds between

<sup>17</sup> *Theodicy*, *Phil.* VI, 432.

<sup>18</sup> *De Stylo Nizolii*, Gerhardt, *Phil.* IV, p. 147.

<sup>19</sup> *Ibid.*

<sup>20</sup> Gottfried Martin, *Leibniz: Logic and Metaphysics* (Manchester, 1964), p. 144.

an army commander and his men, it is not this conventional feature which he is talking about when he repeatedly asserts that relations are beings of reason. He seems rather to be saying that, although we can quantify over or refer to relations, what we are referring to are not entities which are the basic constituents of the world in the manner that individual substances are.<sup>21</sup> But as I have said before, in subscribing to this nominalist thesis, Leibniz is *not* casting any doubt on the reality of relational properties in general or on spatial or temporal properties in particular. Leibniz writes:

. . . time is no more nor less an ideal thing (*ens rationis*) than space is. To co-exist and to pre-exist and to post-exist is something real: though these should not be, I confess, as real as substances or matter are, as is widely assumed.

[Letter to Volder, 23 June 1699; cf. Gerhardt, *Phil.* II, p. 183]

As I have written elsewhere, there is an article of Leibniz's in which he tries to list the most basic concepts from which all other concepts can be defined. And among these concepts, which are for him not further analyzable and thus relatively the most basic, occur "prior" and "posterior."<sup>22</sup> (Thus propositions in which the subject is a rela-

<sup>21</sup> There is a passage in the *Theodicy*, paragraph 32, where Leibniz writes that there is a real distinction between substance and its modifications or accidents. But it is clear that Leibniz is not claiming here that modifications or accidents are entities which have independent existence. He is warning against the kind of mistake which Russell was to make when he wrote that according to Leibniz a substance is the sum of its predicates. Leibniz's real doctrine is that if a set of predicates is true of a substance, it defines it. The substance then has certain accidents, but it is not the same as the sum of these accidents. Accidents or universals cannot exist on their own as particular entities—even as a collection. A set of universals would not be an entity either. It would at most be a complex universal under which particulars may fall.

<sup>22</sup> *Textes inédits de Leibniz*, vol. II, p. 542. See Hidé Ishiguro, "Leibniz's Denial of the Reality of Space and Time," *Annals of*

tion can be reduced to a set of propositions in which relational predicates are ascribed to individuals, but propositions in which relational predicates occur cannot always be reduced to propositions in which no such predicates occur. For although relational properties are not things which exist over and above substances, they are real. Their reality consists in the modification of individual substances and in the harmony or agreement between them.

Before I am through with the nominalist thesis, let me refer to the rather muddled passage in Leibniz's letter to Clarke, which I briefly mentioned before and which is quoted by most of those who have ascribed the reductionist thesis to Leibniz:<sup>23</sup>

The ratio or proportion between two lines L and M may be conceived in three different ways; as a ratio of the greater L to the lesser M; as a ratio of the lesser M to the greater L; and lastly as something abstracted from both, that is, as the ratio between L and M, without considering which is the antecedent, or which the consequent; which the subject, and which the object. . . . In the first way of considering them, L the greater, in the second, M the lesser, is the subject of that accident which philosophers call relation. But, which of them will be the subject in the third way of considering them? It cannot be said that both of them, L and M, are the subject of such an accident; for if so, we should have an accident in two subjects, with one leg in one, and the other in the other; which is contrary to the notion of accidents. Therefore, we must say, that this relation, in this third way of considering it, is indeed out of the subjects; but being neither a substance, nor an accident, it must be a mere ideal thing, the consideration of which is nevertheless useful.

[*Leibniz-Clarke Correspondence*, 5th letter, §47]

---

*the Japan Association for Philosophy of Science*, March 1967, vol. 3, no. 2.

<sup>23</sup> E.g., B. Russell, N. Rescher, and G. H. R. Parkinson.

Leibniz has no good ground for believing that there is something contradictory about accidents having two subjects. According to Leibniz, an accident is something real which nonetheless has no existence apart from the substance in which it inheres. But as the notion of "inherence" is not a spatial one for Leibniz and merely means that it is a part of the true notion of the subject, which in turn is entailed by it being a true predicate of something, there is no reason why an accident should not inhere in two subjects—i.e., why it should not be true of two substances. (As a matter of fact, some of his theories implicitly presuppose the notion of many-placed predicates.) But his main message is clear. He believes that there is no difficulty about ascribing "accident which philosophers called relation" or relational properties to individual subjects. We can say of *M*, for example, that it lies between *L* and something else, and so on. What is an ideal thing is a certain ratio which we find holding between *M* and *L* and which we consider as an abstract object *M/L* but which we might find holding between many other different lines or magnitudes. It is not the relational property a particular line has which is ideal. As Russell pointed out, and as Leibniz seems to have perceived in a confused way, there is of course a special difficulty about treating what is expressed by an open sentence with more than two free variables as an accident with two or more subjects. For if the relation is an asymmetrical one, what is true of one object is different from what is true of the other. The order in which one considers the different subjects vis-à-vis the relation matters. And that is why relational propositions have special kinds of entailment which a logic based entirely on the analysis of a proposition into a subject and a monadic predicate cannot cope with. Leibniz did try to face the difficulty: not squarely, as he should have done, by giving a general analysis of the predicates of the form *fxy*, *fxyz*, etc.; but by attempting various piecemeal analyses of sentences, including particular relational words.

And here I come to Leibniz's fifth thesis about relations—or rather to a cluster of proposals about relations. It is Leibniz's project to rewrite relational propositions in order to expose their logical structures. I will call it the "rewriting project."

As I have said earlier, Leibniz was well aware of the special logical relations which hold between relational propositions. He was aware that they were ill cared for by Aristotle's logic. He admired and quoted the fragmentary logic of relation of Joachim Jungius, who had tried to show the existence of the valid relational inferences which could *not* be reduced to the traditional syllogism. (Leibniz even thought that Jungius was Germany's greatest mathematician and philosopher, equal to Aristotle and Descartes.) In the *New Essays* Leibniz claims with great passion to expose the logical form of arguments like "David is the father of Solomon, so without doubt Solomon is the son of David."<sup>24</sup> He hoped that his system of universal characteristic would enable one to express such deductions as logical truths.

As his rewriting attempts have been discussed in some detail by Mates, I will only expound them to the extent necessary to show that the rewriting project does not support the view that Leibniz held a reductionist thesis about relations: the thesis that truths of relational facts can be re-expressed as sets of propositions in which non-relational properties are ascribed to things. According to Leibniz, relations are based on either comparison or connection (*comparationis vel connexionis*).<sup>25</sup> The relation of being smaller than would belong to the former, whereas that of co-existing would belong to the latter. Leibniz apparently did think that *some* propositions expressing relations based on comparisons could be reduced to a conjunction of propositions in which only non-relational predicates occur, or to a set of such propositions with an-

<sup>24</sup> *New Essays*, Bk. IV, ch. 17, 4.

<sup>25</sup> Couturat, *Opuscles et fragments inédits de Leibniz*, p. 355.



other proposition stating the entailment relationship which these had to one another. For example, Leibniz says that when we claim that "Paul is like Peter," what we claim can be reduced to the conjunction of the propositions "Peter is now A" and "Paul is now A."<sup>26</sup> However, there are other relations based on comparisons from which relational predicates (predicates which say that certain relations hold between the subject and other entities) *cannot* be eliminated. For example, Leibniz attempts to show that propositions of the type "Titus is wiser than Caius" can be reduced to a pair of propositions and a connective indicating that the propositions stand in a certain *logical* relation to each other—i.e., "Titus is wise and as such (*qua talis*) is superior, in so far as (*quatenus*) Caius *qua* wise is inferior." But here it should be remarked that each of the two resultant propositions also contains comparative adjectives "superior" and "inferior" which are not eliminated. What we have is not so much a reduction of any relational proposition into a non-relational proposition as an explicit expression of the relational property by a pair of propositions each of which contains a non-relational predicate *and a relational* predicate (i.e., "is superior" and "is inferior") of the most general form, and in addition a connective which is supposed to express the logical relation of the two relational propositions, e.g., *quatenus*. It is true that when we claim that Titus is superior we are not specifying the person to whom Titus is superior. We are merely saying that Titus is superior to someone, or that there is someone to whom Titus is superior. But we have already seen that the fact that one does not name the second term of the relation does not make the property expressed by "is superior" any less relational. Its sense depends on there being another person to whom the subject's ability is compared. (One could, I suppose, compare the ability of a person at a particular time to the ability of the same person at another time.)

<sup>26</sup> *Ibid.*, p. 244.

There is a very great difficulty about making clear exactly what logical relation exists between two propositions connected by the connective *quatenus*, which must be non-extensional and presumably intuitively means something like "by virtue of." (Material equivalence is no good as an explication. It lets in too much. For example, " $2 + 2 = 4 \equiv$  snow is white," but one would not want to say " $2 + 2 = 4$  *quatenus* snow is white." On the other hand, logical equivalence seems too strong. It seems possible that Titus should be wiser than many other people, without Caius being less wise. A certain consequence of Leibniz's mirror thesis could make this impossible but I will not go into the detail of the problem here.) All that I am anxious to stress is that there is no elimination of relational properties in what is expressed by the rewritten result. Not only is there a relational expression (viz., a comparative) in each of the sentences; the two propositions expressed by them are claimed to be related in a non-extensional way.

When we come to relations which are based on connections, the elimination of relational properties—if that were the project—becomes even more difficult. In another manuscript, Leibniz writes that "Paris is the lover of Helen" can be logically reduced to "Paris loves and by that very fact (*eo ipso*) Helen is loved."<sup>27</sup> Again, strictly speaking, this is an expansion rather than a reduction for, as Leibniz remarks, the original proposition is shown up to be logically a "compendium" of two propositions—this time linked by the logical connection *eo ipso*. And each of the two propositions is still a relational proposition in the sense that it conceals a two-place predicate, since the first means Paris loves someone, and the second means that Helen is loved by someone. It is part of their truth condition that there is someone whom Paris loves and that there is someone who loves Helen.<sup>28</sup> Thus although

<sup>27</sup> Couturat, *op. cit.*, p. 287.

<sup>28</sup> As Professor Hintikka correctly says in his persuasive paper (cf. *intra*, p. 162), "Paris loves someone" is the form  $(\exists x) aRx$ ,

a relational proposition in which two individuals are mentioned (a form which Leibniz seems to have thought to be logically complex or derivative) has been eliminated, in each of the propositions in the rewritten result relational properties are still ascribed to the subject, relating him to another person. The connective *eo ipso* shows, moreover, that the original proposition is *not* a truth function of the two constituent propositions.

It might be objected that I am wrong to equate "Paris loves" with "there is someone whom Paris loves." If Paris is in love with his shadow as was Narcissus, the former proposition will be true but the latter will not.<sup>29</sup> But even if, as a matter of fact, there are complexities about this verb, there is no doubt that Leibniz thought that all predicates implicitly if not explicitly carry reference to other existents. It is also quite clear that for Leibniz relational propositions of the type "A is adjacent to B" or "A precedes B" *cannot* be reduced to a "compendium" of non-relational propositions. For example, even if we paraphrase "A preceded B" to "A existed at  $t_1$  and B existed at  $t_2$ ," times such as  $t_1$  and  $t_2$  are themselves *entia rationis* for Leibniz and logically *derived from* proposi-

---

and this can be seen as ascribing the monadic predicate  $(\exists x) \dots Rx$  to  $a$ . But as I have said before, a proposition can be thought to be obtained by giving arguments to different predicates, and it is not easy to decide whether it can be said to be relational or non-relational. I would prefer to call  $(\exists x)aRx$  relational because its truth-conditions involve the obtaining of a relational fact, and because it contains the predicate  $R$  which is originally a two-place predicate.

<sup>29</sup> Thus it might be thought that "love" is an intentional verb in Chisholm's sense, since the existence of the object of love does not affect the truth-value of propositions of the form " $x$  loves  $y$ ." For example, one may say truly that St. Francis of Assisi loved God although one may strongly doubt whether God exists or not. Thus " $\dots$  loves God" just ascribes to a person a particular state, a disposition, which does not involve the truth of any relation holding between the subject and any other object. I myself think that it is by no means clear whether the verb "love" exhibits this feature of intentional verbs.

tions in which relational properties are ascribed to substances and their mutual order is expressed.

Thus Leibniz's project of rewriting certain relational propositions cannot have been part of any general plan for reducing relational properties. Leibniz was interested in any reduction or paraphrase of irregularities and unnecessary complexities in the grammar of ordinary language which would make language amenable to calculus.<sup>30</sup> He wanted to construct a language whose syntax would reflect the truth-functional and other logical relations of all the propositions expressed in it. This, he thought, was what arithmetic already did.

I have tried to disentangle five theses concerning relations which Leibniz held: the presupposition thesis, the individuation thesis, the mirror thesis, the nominalist thesis, and finally the rewriting project. I have tried to show that none of them leads to any theory about the reducibility of relational predicates. By relational predicates I mean predicates which ascribe relational properties to the subject (including those which can be treated as monadic predicates) and have a sense which involves the truth of the ascription of a non-monadic predicate to things. I have also tried to make clear that none of these theses imply that relational properties of objects are less real than non-relational ones.

Before I conclude this paper I should probably make a comment about a passage in which Leibniz appears to support a reductionist thesis. Immediately after writing the passage—quoted earlier from his letter to Arnauld—about an individual concept including relational properties, Leibniz goes on to make the often quoted claim that every state of a monad follows from its own preceding state “as if there were nothing but God and itself in the world.” In my view this must be a strange mistake. It contradicts Leibniz's previous assertion and his basic posi-

<sup>30</sup> He also attempted to reduce sentences with words in the genitive case or plural nouns to sentences which did not contain them.

tions. For if the list of predicates which make up an individual concept includes relational predicates or somehow expresses relational properties, then they would not be true of that individual in a universe in which there was nothing except that individual substance and God (and hence would not be the concept of that individual). Even the perceptual states of an individual substance which succeed one another, the description of which might seem to be possible without reference to anything else, are not logically independent of the truths about the existence of other substances. For Leibniz to say of a substance that it perceives, or mirrors, or represents, another object, presupposes that the monad stands in a certain connection to the other object.

One expresses another, in my use of the terms, when there is a constant and regulated relation between what can be said (i.e., the predicates) of the one and of the other . . .

[Gerhardt, *Phil.* II, p. 112]

Perception, intellectual knowledge, animal feeling are all, Leibniz says, species of expressions or representations. So to say of a substance that it perceives the universe from its point of view is to say that there is a regulated relation between what can be said of that substance and what can be said of all the other objects in the universe.<sup>31</sup> Thus one would be ascribing a perceptual state to an individual monad falsely if there were nothing else in the universe for the monad to perceive. God may be able to make a monad believe falsely that it perceives when it does not, but even God cannot make the monad perceive or have *perceptual* states if there be nothing else in the universe.

<sup>31</sup> I realize that difficulties can arise again, since the verb "to say of  $x$ " can be taken again as an intentional verb in Chisholm's sense, and hence " $a$  says of  $b$ " might not entail " $(\exists x)a$  says of  $x$ ." But as Leibniz's theory of representation is so closely connected with his theory of the pre-established harmony, I would like to take it extensionally.

What the monad would be doing would not, by definition, be perceiving.<sup>32</sup>

In any case, then, Leibniz was being clearly inconsistent when he wrote that the succeeding states of individual substances follow each other "as if there were nothing in the universe but God and itself." It is incompatible with *any* standard interpretation of his mirror thesis, and not merely with my interpretation. Indeed, as Leibniz goes on immediately to say in the letter to Arnauld, he wanted to maintain that this "independence" (as he calls it) of substances "does not lessen the interconnection (commerce) between the substances." So long as substances are individuated by their perceptual states, as Leibniz claims they are, it is a logical truth that there is more than one substance in the universe and that they are connected to each

<sup>32</sup> Montgomery Furth has written ("Monadology," *The Philosophical Review*, April, 1967, p. 172; also in this volume, p. 103), that ". . . the world of a monad is, in a phrase of Miss Anscombe's, an 'intentional' object of the monad's conscious or unconscious awareness. Hence for a monad . . . there is no incompatibility between (on the one hand) its being to that monad as if things were thus-and-so, and (on the other) things not being thus-and-so—perhaps, for that matter, nothing else existing at all." But what is it for it to be to a monad as if it were perceiving that things were thus, if it never had perceived? It seems to me that the expression "the world of a monad" is already misleading. The question is not one of the identity of the successive states of a monad which one may correctly or incorrectly characterize. It is the question of what is involved in the characterization of such states and the truth-condition of predications of the states. As we have seen, Leibniz likens individual substances to mirrors which reflect the world. It might be said that one can produce the same image on a mirror by reflecting a real tree and, say, a clever two-dimensional picture of a tree; thus the "state" of the mirror is the same in the two cases although its relational properties are different. As I have said already, Leibniz thought that if the relational properties of a monad were different, its states would in consequence be different as well. But even if one were to dispute this as a matter of empirical fact, it still remains true that for *a mirror* to have an image there must be something other than itself which it reflects. It is not an accident that Leibniz uses the analogy with mirrors.

other in a definite way. This is the other side of the truth, rightly pointed out by Benson Mates, that in Leibniz's system an individual concept can be instantiated only in one world. As Leibniz says, "This mutual connection or accommodation of all created things to each other and of each to all the rest causes each simple substance to have relations which express all the others and consequently to be a perpetual living mirror of the universe."<sup>33</sup> This is what I earlier called the "mirror thesis." That our basic concepts include relational ones, and that we cannot exclude relational terms from "the alphabet of human thinking," is a fact of what Leibniz called "logical grammar." And this reveals the metaphysical truth that one cannot remove the interconnection of things and leave a *plurality* of them without their relation to one another. Recent writers on Leibniz<sup>34</sup> have tried to reverse the view of Russell and Couturat and have claimed that Leibniz's logical doctrines have roots in his metaphysics and not vice versa. But Leibniz himself wrote that "real metaphysics is hardly different from real logic, that is to say, from the general art of discovery."<sup>35</sup> In this sense his five theses concerning relations, whether syntactical or metaphysical in nature, are all intricately interwoven, though they must be distinguished.

<sup>33</sup> *Monadology*, p. 56.

<sup>34</sup> E.g., Rescher, *op. cit.*, p. 76; Ruth Saw, *Leibniz*, Penguin Books, 1954, p. 203.

<sup>35</sup> In Couturat, "Sur la métaphysique de Leibniz," *Revue de Métaphysique et de Morale*, January 1902.





# LEIBNIZ AND SPINOZA ON ACTIVITY

MARTHA KNEALE

The influence of Spinoza on Leibniz is a topic on which scholars have held markedly dissimilar views. Ludwig Stein holds that Leibniz went through a Spinozistic period and, while later violently repudiating Spinozism by name, retained some Spinozistic traits in his mature work.<sup>1</sup> Georges Friedmann, on the other hand, maintains that Leibniz's philosophy was in essentials fully formed before he had any knowledge of Spinoza's work and that, although his attitude towards Spinoza underwent considerable change, there was no enthusiastic reception followed by rejection.<sup>2</sup> It is beyond the scope of a single paper to examine the whole issue, but I hope to throw some light on it by considering in detail the theories of activity and passivity put forward by Spinoza and Leibniz.

I have chosen this topic for two reasons. First, Bertrand Russell accuses Leibniz of borrowing his theory of passivity directly from Spinoza without acknowledgment. He says:

From this point onwards, Leibniz's philosophy is less original than heretofore. Indeed he is chiefly engaged in adapting to the doctrine of monads previous theories (notably that of Spinoza), which, by means of the relation of activity and passivity, become available for him in spite of the denial of transeunt action.

This essay has been written especially for this volume.

<sup>1</sup> L. Stein, *Leibniz und Spinoza*, Berlin, 1890.

<sup>2</sup> G. Friedmann, *Leibniz et Spinoza*, Paris, 1946, p. 64 and p. 188.

Thus a sharp line should, I think, be drawn between those parts of Leibniz's philosophy which we have hitherto discussed, and those which, through passivity, depend upon the apparent interaction of monads. The former seem mainly original, while the latter are borrowed in great part, although always without acknowledgment, from Spinoza.<sup>3</sup>

Second, the theories themselves are more strange and perplexing than has generally been recognized by commentators. By examining the passages in detail, I hope to show that Leibniz's theory, while in some points reminiscent of Spinoza's, is certainly not identical with it and was worked out to meet the needs of his own system.

I shall begin by examining Spinoza's theory, which is earlier in time and which was certainly known to Leibniz when he put forward his own account in the *Discourse of Metaphysics*. It is briefly stated at the beginning of Part III of the *Ethics* as follows:

Definition I. I call that an adequate cause of which the effect can be clearly and distinctly perceived through it. I call that inadequate or partial, on the other hand, of which the effect cannot be understood through itself alone.<sup>4</sup>

Definition II. I say that we are active when something in us or outside us happens of which we are the adequate cause, that is (by the preceding definition) when there follows something either in us or outside us from our own nature which can be clearly and distinctly understood through it alone. I say that we are passive, on the other hand, when something happens in us or something follows from our own nature of which we are at most the partial cause.<sup>5</sup>

<sup>3</sup> *The Philosophy of Leibniz*, 2nd ed., London, 1937, p. 139.

<sup>4</sup> Spinoza, *Opera*, ed. C. Gebhardt, vol. II, p. 169. (This work will hereafter be referred to as Geb. Translations of passages are by the author.)

<sup>5</sup> *Ibid.*

One surprising proposition is involved in Definition II, namely, that something can happen outside a given mode which can be clearly and distinctly understood in terms of the nature of that mode alone. This is surprising because the general doctrine of Part II of the *Ethics* seems to imply that any transaction involving two or more modes can be fully understood only in terms of the nature of all of them. Since I am not now primarily concerned with Spinoza, I shall pass over this point. Two other points, however, merit notice. First, the definitions of activity and passivity apply strictly only to human beings. At least, I take human beings to be the denotation of "we" (*nos*). Spinoza believes that Definition II has wider application<sup>6</sup> but states it in this restricted form because human emotions are his sole interest in this part of the *Ethics*. In the second place, the definitions are given in epistemological terms. The adequate cause is that through which something else can be *understood*. We have immediately to ask "Understood by whom? By God? By the mode in which the event occurs? Or by some other mode?" It seems that the notion of adequate cause, and therefore that of activity, may be understood as relative in the sense that X may be the adequate cause of Y for A but not for B. To the radio engineer the transmission together with the state of the intervening media constitute an adequate cause of the image on the television screen; for me they do not. Or, more pertinently to Spinoza, for the psychiatrist a childhood trauma may constitute the adequate cause of an adult breakdown; for the patient's relatives it may not. Spinoza may be able to escape this relativism. He says "can be understood" not "is understood" and perhaps the notion of clarity and distinctness implies an absolute standard; but in view of the comparison to be made with Leibniz, it is worth pointing out that he could be taken in this relativist way.

<sup>6</sup> *Ethics*, III, 3, Schol. (Geb. II, p. 145.)

Spinoza almost immediately proceeds to make use of these definitions in the proof of Proposition 1:

Our mind is in some cases active, but in others passive; that is, in so far as it has adequate ideas to that extent it is necessarily active, and in so far as it has inadequate ideas to that extent it is necessarily passive.<sup>7</sup>

I shall not concern myself with the details of the proof. It depends on a number of propositions in Part II and is such as to justify Leibniz's remark that Spinoza is not a master of demonstration.<sup>8</sup> It is clear in any case that the demonstration must be faulty. Proposition 1 cannot follow from Definitions I and II without an extraordinary change in the meanings of words, for it is not the case that it is only the having of adequate ideas which makes events in human life intelligible. We can see this by thinking again of the psychiatric patient. His reactions may be quite intelligible to the psychiatrist and to himself in terms of his apprehension of his situation, but this does not mean that this apprehension consists in adequate ideas. According to Definition II, the psychiatric patient is active, and perhaps to a greater degree than the normal person, because his reactions may be entirely explicable in terms of his own state with little reference to the environment; but according to Proposition 1, he must be passive because his ideas are inadequate. It is Proposition 1 that dominates Spinoza's thought. On it depend such characteristic propositions as 5, 3: "An emotion which is a passion ceases to be a passion as soon as we form a clear and distinct idea of it."<sup>9</sup> What Spinoza wishes to prove is that a man is free, powerful, and happy in so far as he has adequate ideas. Definitions I and II of Part III are inserted because they seem to be plausible and to provide

<sup>7</sup> Geb. II, p. 140.

<sup>8</sup> G. W. Leibniz, *Philosophische Schriften*, ed. C. I. Gerhardt, vol. I, p. 148. (This work will hereafter be referred to as G.)

<sup>9</sup> Geb. II, p. 282.

a proof for the desired conclusions, but we have seen that this is not so.

Spinoza distinguishes the state of being perfect, i.e., of having adequate ideas, from the state of transition to greater perfection. Pleasure (*laetitia*) is not a perfection but the transition to a greater perfection, and pain (*tristitia*) is transition to a lesser perfection.<sup>10</sup> His exposition is somewhat confusing in that he first introduces pleasure and pain as passive states (*passiones*):

By pleasure, therefore, in what follows I shall understand a passive state in which the mind passes to a greater perfection. By pain, on the other hand, a passive state in which it moves to a lesser perfection.<sup>11</sup>

Later, however, he admits that there may be active states of pleasure, although not of pain:

Besides the pleasure and desire which are passive states, there are given other emotions of pleasure and desire which pertain to us in so far as we are active.<sup>12</sup>

It is easy to see in terms of Definition II why a human being may be active in having or bringing about a pleasurable state. He may be the adequate cause of his own transition to a greater perfection. But it is not clear why he should not in this sense be active in having or bringing about a painful state. We do often bring injury and pain upon ourselves. Spinoza is here thinking in terms of Proposition 1. It is inconceivable to him that we should bring injury or pain upon ourselves while having adequate ideas.

Leibniz's theory is first put forward, as far as I know, in the *Discourse of Metaphysics*, written in 1684 at the earliest and therefore at least six years after he had access to the full text of Spinoza's *Ethics*. It is not easy to prove that this is so, but there is evidence that Leibniz was conscious of having reached a new and firm position in the

<sup>10</sup> Geb. II, p. 191.

<sup>11</sup> *Ethics*, III, 11, Schol. (Geb. II, p. 149.)

<sup>12</sup> *Ethics*, III, 58. (Geb. II, p. 187.)

*Discourse*,<sup>13</sup> and it has plausibly been suggested that the novel element which enabled him to unify the whole system is the notion of representation.<sup>14</sup> If this is new, it follows that the theory of activity and passivity is also new, for, as we shall see, it essentially involves the notion of representation. Friedmann, in his anxiety to show that Leibniz had completed his system before he knew anything of Spinoza, tends to minimize the elements of novelty in the *Discourse*,<sup>15</sup> but he nevertheless suggests that the theory of expression was worked out in reaction to Spinoza.<sup>16</sup>

Before turning to the *Discourse* itself we may note that there is some evidence that Leibniz was earlier preoccupied with Part III of the *Ethics* and especially with Definition II. In a letter to Placcius of February 1678, Leibniz says of Spinoza: "He says many good things about the emotions" (*De affectibus multa dicit egregia*).<sup>17</sup> What these "good things" were it is not easy to say. In a paper of 1679 headed *On the Emotions* (*De Affectibus*),<sup>18</sup> Leibniz sketches a number of definitions, apparently as part of one of his many projects for an encyclopedia. Neither the general definition of *affectus* nor the definitions of the particular emotions are like Spinoza's, and in fact, Leibniz seems to be more interested in emending Descartes. But we find scattered among the other definitions five attempts at a definition of action and passion (*actio* and *passio*) which may have been suggested by the reading of Spinoza:

1. An action is a change in something of which the proximate cause is in itself.  
(*Actio est mutatio in aliquo cuius causa proxima in ipso est.*)

<sup>13</sup> See *Discourse on Metaphysics*, trans. P. G. Lucas and L. Grint, Introduction, p. xiv.

<sup>14</sup> *Ibid.*

<sup>15</sup> Friedmann, *op. cit.*, p. 109.

<sup>16</sup> *Ibid.*, p. 86.

<sup>17</sup> Quoted by Stein, *op. cit.*, p. 308.

<sup>18</sup> *Textes inédits*, ed. G. Grua, Paris, 1948, vol. II, pp. 512-37.  
(This work will hereafter be referred to as Grua.)

A passion is a change in something of which the proximate cause is in something else.

(*Passio est mutatio in aliquo cuius causa proxima in alio est.*)<sup>19</sup>

2. An action is a state which is a proximate cause of a change.

(*Actio est status aliquis qui causa proxima mutationis est.*)

A passion is a state of something which is the proximate effect of a change.

(*Passio est status aliquis qui effectus proximus mutationis est.*)<sup>20</sup>

3. An action is a state of a thing from which there directly follows an immediate change in something else.

(*Actio est status rei ex quo proxime sequitur mutatio alterius praesens.*)

A passion is a state of a thing by means of which it happens that there follows an immediate change in it.

(*Passio est status rei quo fit ut in ea sequitur mutatio alterius praesens.*)<sup>21</sup>

4. An action is the state of a thing by means of which the reason of an immediate change can be given. In this case the thing is called the cause.

(*Actio est status rei ex quo mutationis alicuius praesentis ratio reddi potest, quae res dicitur causa.*)

A passion is a state belonging to a thing inasmuch as an immediate change follows in it. In this case the thing is called the subject of change or the object of the cause.

(*Passio est status rei quatenus in ea sequitur mu-*

<sup>19</sup> Grua, p. 512.

<sup>20</sup> *Ibid.*

<sup>21</sup> Grua, p. 513.

*tatio praesens, quae res dicitur subjectum mutationis vel objectum causae.)*<sup>22</sup>

5. An action is a state of a thing in virtue of which something follows from its nature.

*(Actio est status rei quo quid sequitur ex eius natura.)*<sup>23</sup>

A passion is a state of a thing which prevents something happening from its nature.

*(Passio est status rei quo impeditur aliquid ne ex natura.)*<sup>24</sup>

The third pair of definitions was canceled by Leibniz, and between the definitions of action and passion in the last pair Leibniz later inserted an example followed by what is in effect a sixth definition of action with no corresponding definition of passion:

6. An action seems to be a kind of determination, namely, that from which something follows from the nature of the thing in which it follows.

*(Videter actio esse quaedam species determinationis, scilicet id ex quo quid sequitur ex natura rei in qua sequitur.)*<sup>25</sup>

In translating these definitions I have used "an action" and "a passion" throughout, in order to show that Leibniz was throughout concerned with the same Latin words *actio* and *passio*. This does not give an easy reading in English except in the case of the first definition of action, for "action" to us signifies an event rather than a state. The awkwardness may not be so great in Latin, for *actio* seems sometimes to signify a state and *passio* often does. The shift from *mutatio* in the first definition to *status* in the second suggests that what Leibniz is interested in defining is the kind of state which we call "activity" rather than the kind of event which we call "an action."

<sup>22</sup> Grua, p. 513.

<sup>23</sup> Grua, p. 526.

<sup>24</sup> Grua, p. 527.

<sup>25</sup> *Ibid.*



All these definitions differ from Spinoza's in being of the traditional form (*per genus et differentiam*). In all cases the genus of action is first given and the differentia follows. In pair 1 the genus is change (*mutatio*), in 2-5 state (*status*), and in 6 determination (*determinatio*). That the last change is not merely verbal is shown by the fact that determination itself is defined as a sort of state.<sup>26</sup> Spinoza, on the other hand, does not give a direct definition of the noun "action" but rather defines the verbal phrase "we act" (*nos tum agere dico cum . . .*). Leibniz himself returns to this more informal style in the *Discourse* which suggests that it may be more appropriate to the subject matter. His preference for the traditional Aristotelian style in the list of definitions is probably determined by a wish to incorporate them into a deductive system in which *definiens* can be substituted for *definiendum* in a rule-of-thumb way.

Apart from this change in the manner of presentation, the first definition is remarkably like Spinoza's, the only material difference being the substitution of the notion of proximate cause for that of adequate cause. In the second definition, however, we see Leibniz trying to get away from the implication both of Spinoza's definition and of his own first attempt, namely, that the cause of a change in one thing may lie in another thing. We may conjecture that he is already working with the notion of the windowless monads, and he seems not to see yet that this makes the distinction between activity and passivity meaningless as applied to his individual substances. If all change in a substance arises from its own nature, what point is there in calling it either active or passive? Not seeing this, apparently, Leibniz in his second pair of definitions tries to distinguish action and passion in a single thing without reference to a second thing. But a very little reflection must have shown him that, using this pair of definitions, it would be easy in his system to prove that any state of

<sup>26</sup> Grua, p. 526.

a thing would be both an action and a passion, so that the distinction would become pointless.

In the third pair of definitions, which is canceled, the reference to a second thing is again introduced in the definition of an action. The reason for the cancellation is probably that Leibniz is still unwilling to admit that this reference is necessary to the meaningful distinction between activity and passivity.

In the fourth pair of definitions Leibniz introduces the epistemological notion used in Spinoza's Definition I. An action is a state of a thing which *explains* a change (*ex quo mutationis ratio reddi potest*). The definition of a passion does not here match that of an action. The corresponding definition would have been "a passion is a state of a thing which is explained by an immediately preceding change"; but this is a description which in Leibniz's system would obviously apply to every state of a thing. The two definitions could easily be made intelligible if reference to a second thing were introduced, but Leibniz is apparently unwilling to do this explicitly.

In the fifth pair of definitions a new idea is introduced, that is, the notion of the prevention of a change which would otherwise happen. An action is said to be the state of a substance in which something happens from its own nature. This is very reminiscent of Spinoza. In the definition of a passion, however, Leibniz evades the reference to a second thing by saying that a passion is a state of a substance in which something arising from its own nature is prevented from happening. But how could it be prevented except by the intervention of some other thing? If a thing is left to itself, it must proceed according "to its own nature," if that phrase has any meaning at all.

In framing the inserted additional definition of action, Leibniz seems to have seen this, as is shown by the illustration of the balance which precedes the definition. If two equal weights are placed in a balance at equal distances from the fulcrum, no action will follow; i.e., in a

sense neither weight acts according to its own nature. Leibniz says: "So each body is determined, each is passive in relation to the other or alternatively acts upon the other. But neither does that to which it was determined." (*Itaque utrumque corpus determinatum est, utrumque ab altero patitur sive in alterum agit. Sed neutrum agit id ad quod erat determinatum.*)<sup>27</sup> The last word presumably means "determined by its own nature."

By the time he wrote this addition, Leibniz must have realized that the notion of interaction of substances must be introduced if the activity-passivity contrast is to be made meaningful. In the main, however, this series of definitions may be regarded not as an attempt to adapt Spinoza's theory to the doctrine of monads, as Russell suggests, but rather as an unavailing attempt to frame definitions of action and passion which are free of the essential element in Spinoza's theory, the notion of interaction between substances. Leibniz already knew that this could not be fitted into his picture of metaphysical reality. The picture is quite different when we come to the *Discourse*, for by this time Leibniz thought he had solved the problem of retaining a meaningful distinction between activity and passivity within the framework of his system. The key to the solution is the distinction between reality, the world of monads, and *phenomena bene fundata*. The activity-passivity distinction is not applicable to the world of monads, but it can be usefully applied to phenomena for scientific and practical purposes, and it will be most usefully applied if the distinction we make between phenomena corresponds to a real distinction in the world of monads. Leibniz has therefore two questions to answer:

1. What criterion or criteria is it best to adopt in applying the activity-passivity distinction to phenomena?
2. What in the world of monads corresponds to this distinction?

<sup>27</sup> Grua, p. 527.

I shall now consider Leibniz's exposition in the *Discourse* and the correspondence with Antoine Arnauld. The summary of Article 15, which was the only part sent to Arnauld, runs:

The action of one finite substance upon another consists only in the increase of the degree of its expression accompanied by the diminution of that of the other, inasmuch as God has made them in advance so that they fit in with each other.<sup>28</sup>

Leibniz is here explaining what it is in the world of monads that corresponds to activity and passivity in phenomena. This explanation could not provide a criterion for the application of the distinction in the world of common sense, since in the case of almost all monads (perhaps all monads other than ourselves) we have no way of telling whether the monad's degree of expression is increasing or diminishing. A first glance might suggest to us that Leibniz is here borrowing from Spinoza, especially as in Article 15 he connects activity with pleasure and passivity with pain, which Spinoza also associates with increase and decrease of perfection. More careful examination, however, shows that Leibniz is here saying something quite different from anything Spinoza says. Spinoza connects activity with perfection, i.e., with the having of adequate ideas; in Leibniz's system, this corresponds to clarity of perception and not with the *passage* to greater perfection. If Leibniz is here drawing upon Spinoza at all, it is by way of confused memory. He certainly did not look up the *Ethics* before writing this article. Moreover the view expressed by Leibniz involves him in paradoxes to which Spinoza is not committed. Since activity and passivity are correlative, it follows from Leibniz's explanation that whenever the clarity of expression of one monad is increasing, the clarity of expression of the other monad involved in the transaction is decreasing. Expression in hu-

<sup>28</sup> G. II, p. 13.

man beings, as Leibniz later explains to Arnauld, is perception or understanding:

Expression is common to all monads and is a genus of which natural perception, animal feeling, and intellectual understanding are species.<sup>29</sup>

Therefore the one certain case we know of increase of clarity of expression is increase in understanding in a human being. We hope that this sometimes occurs when people are taught, but it would be an unhappy pedagogical world in which the enlightenment of the pupil involved the obfuscation of the teacher and the pleasure of the pupil corresponded directly with the pain of the teacher. It is clear too that the attribution of activity and passivity is the opposite of what would be expected, for we think of the teacher as the active partner. Spinoza is not involved in these paradoxes. For him the teacher will be the active partner, as having the more adequate ideas; and the pupil will be passive, as having, at the beginning of the process at least, less adequate ideas. He will experience pleasure if he is in fact enlightened. The teacher may or may not experience pleasure, for his ideas may or may not be clarified by the teaching process.

There is small wonder that Arnauld, to whom Leibniz's use of the term "expression" had not yet been explained, found the summary of Article 15 obscure. But before discussing Arnauld's reactions I shall consider the rest of Leibniz's article, which was not sent to him. It runs as follows:

But without entering into a long discussion, it is sufficient at present, in order to reconcile metaphysical language with practice, to say that we attribute more to ourselves, and with reason, the phenomena which we express more perfectly, and that we attribute to other substances that which each expresses best. Thus a substance which is of infinite extent, inasmuch as

<sup>29</sup> G. II, p. 112.

it expresses everything, is limited by the manner more or less perfect of its expression. It is thus that one can understand how substances mutually impede and limit each other, and consequently one can say in this sense that they act upon each other and are forced, so to speak, to fit in with each other. For it can happen that a change which increases the expression of one diminishes that of another. Now the virtue of a particular substance is to express the glory of God well, and it is in this respect that it is least limited. And each thing, when it exercises its virtue or power, that is to say when it acts, changes for the better and extends itself inasmuch as it acts: when, therefore, a change occurs by which several substances are affected (and in fact every change affects all) I believe that one can say that the one which immediately passes thereby to a greater degree of perfection, or to a more perfect expression, exercises its power and acts and that which passes to a less degree makes clear its weakness and is passive. I also hold that all activity of a substance which has perception brings with it some pleasure and all passivity some pain and vice versa.<sup>30</sup>

The first sentence here is difficult to interpret, but we should expect from the context that "to attribute a phenomenon to ourselves" is to regard ourselves as active in the occurrence of that phenomenon, for the final sentence of the previous article [14] states that Leibniz is about to explain the attribution of action. He is saying, then, that we rightly regard ourselves as active in the occurrence of those phenomena which we best express. We have already seen that for a conscious creature to express something is to perceive or understand it, so that we rightly regard ourselves as active when some phenomenon occurs which we understand very well. This is the position taken up by Spinoza in *Ethics*, III, Proposition 1, namely, that we are active when we have adequate ideas.

The first puzzling thing about this statement, as I have

<sup>30</sup> G. IV, pp. 440-41.

noted in connection with Spinoza, is that it seems obviously untrue. A dentist being operated upon by another dentist may understand what is going on very well, but he would scarcely regard himself as active. It may be that in taking up this position both Spinoza and Leibniz were thinking mainly of what they regarded as human activity *par excellence*, i.e., voluntary intellectual activity as in working out logical, mathematical, or philosophical problems. They both make the scarcely questioned assumption that this activity is both the clearest kind of understanding and the most clearly understood. It is not difficult to see why this assumption should be made. It seems plausible to say that a man engaged in purely intellectual activity knows what he is about more than he does when engaged in any other sort of activity. Our physical movements and our imaginative strivings remain to some extent mysterious but, we are inclined to say, our *thinking* is utterly intelligible. Whether this assumption is true or not, the activity of thinking does not provide a good clue to the nature of the activity-passivity antithesis, for in thinking we are not in any obvious way operating on or being operated upon by any other thing.

The second surprising thing about this first explanation in Article 15 is that it does not agree with what Leibniz says in the summary sent to Arnauld nor with what he says later in the same article. To be in a state of relatively clear perception is not the same thing as to be in a state of increasing clarity of perception. The sentence which begins "And each thing, when it exercises its virtue or power" repeats in more detail what is said in the summary and adds that increase of perfection is accompanied by pleasure and decreased by pain. It follows that whenever two conscious beings are in the agent-patient relation, one experiences pleasure and the other pain. This is fortunately untrue and it is improbable that Leibniz believed it.

We have, then, in Article 15 two distinct accounts of activity and passivity. But these are not the only accounts to be found in Leibniz's writings. He explains the matter

in yet another way in reply to Arnauld's request for an elucidation of the activity-passivity antithesis in relation to the mind-body problem. In his letter of September 28, 1686, Arnauld presents Leibniz with two examples: "I am wounded in the arm and feel pain," and "I raise my arm voluntarily."<sup>31</sup> These examples may have made Leibniz rethink his position. The first was thought to be a case of the action of body upon mind, and while it may be plausible to say that the clarity of the mind's perceptions is diminished in feeling pain, there is no reason to suppose that the monads composing the body express their environment any more clearly when it is wounded. In fact neither of the accounts given by Leibniz would fit a case of the action of body upon mind, for the monad which is the mind presumably always has clearer perception than any one of the group of monads which constitute the body. And only one of his accounts fits the action of mind upon body, for while the mind doubtless has clearer perceptions than the body, there seems to be no reason to suppose that the clarity of its perception increases when a man performs a simple voluntary action such as raising his arm, nor that the degree of representation of the monads composing his body is then diminished.

Leibniz did not openly retract his views, but perhaps some awareness of these difficulties caused him to give a different account of the matter in a draft reply to Arnauld. He says:

We attribute action to the substance of which the expression is more distinct and we call it the cause. As when a body floats in water there is an infinity of movements of the parts of the water such as are necessary in order that the place which the body leaves should always be filled by the shortest path. This is why we say that this body is the cause, because through it we can distinctly explain what happens.<sup>32</sup>

<sup>31</sup> G. II, p. 65.

<sup>32</sup> G. II, p. 68.



In this passage the phrase "of which the expression is more distinct" is ambiguous. It may mean "which expresses other things more clearly" (i.e., "which, if conscious, has the clearer ideas") or "which is expressed more clearly by us" (i.e., "of which we have the clearer idea"); but the final phrase is quite unambiguous. We call it the cause because it has for us the greater explanatory power. Having the greater explanatory power for us is, as I have already pointed out, a relative notion. What has the greater explanatory power for us depends on who we are.

Leibniz goes on to say that since motion is relative, we could equally suppose the floating body to be stationary and the particles of fluid in motion. There is no real causal connection between the moving bodies. The only real cause is God, who has planned their harmonious movements; but "since it is not reasonable to have recourse to God, one has recourse to the ship" (*comme il n'est pas raisonnable de recourir à Dieu dans le détail, on a recours au vaisseau*).<sup>33</sup>

A little later he makes the connection with the mind-body problem:

It is then for the same reason that we attribute pains to the movements of bodies, because we can in this way come to something distinct. And this helps us to bring phenomena about or to prevent them.<sup>34</sup>

Here Leibniz repeats the point that no individual substance has any influence on any other, and continues:

But nevertheless we have much reason to say that my will is the cause of the movement of my arm and that a break in continuity in the matter of my body is the cause of the pain; for the one expresses distinctly what the other expresses only confusedly, and one should attribute activity to the substance of which the expression is more distinct. Moreover this helps in

<sup>33</sup> G. II, p. 70.

<sup>34</sup> *Ibid.*

practice to bring about phenomena.<sup>35</sup> If it is not a physical cause, one could say that it is a final cause or, perhaps better, exemplary cause, that is to say, that the idea of it in God's understanding contributed to the resolution of God in regard to this particular fact when he was concerned to determine the universal order of things.<sup>36</sup>

In this passage there are four different accounts of what it is for a substance A to be active or causal in an apparent transaction with another substance B:

1. It is for A to be more clearly understood than B.
2. It is for A to have clearer perceptions than B.
3. It is for a change in A to be producible by us as a means to the production of a change in B.
4. It is for God to have more regard for A than for B in choosing the order of the universe.

The fourth view is somewhat obscurely expressed in the present passage, but it seems clear from *Monadology* 52 that this is what Leibniz meant. It is worth while quoting the whole passage in the *Monadology* (49–52) which deals with activity and passivity, for it reproduces the doctrine of this draft letter with remarkable exactness and shows how little Leibniz changed his views in thirty years. It is certainly true that his philosophy reached its final form in the *Discourse*. The passage runs as follows:

49. The creature is said to act outside itself inasmuch as it has perfection and to be passive in relation to another in so far as it is imperfect. Thus one attributes activity to a monad inasmuch as it has clear perceptions and passivity inasmuch as it has confused perceptions.

50. And a creature is more perfect than another in that we find in it something which serves to give a

<sup>35</sup> Gerhardt has "*soit à la pratique*"; G. Leroy, in his edition of the *Discourse* (Paris, 1957), reads "*suffit*," which gives a better sense. It seems possible that Leibniz wrote "*sert*."

<sup>36</sup> G. II, p. 71.

reason a priori for what happens in the other and this is why we say that it acts on the other.

51. But among simple substances there is only an ideal influence of one monad on another which cannot have its effect except by the intervention of God, inasmuch as in the ideas of God a monad rightly asks that God should have regard to it in regulating the others from the beginning of things. For since a created monad cannot have a physical influence on another, it is only in this way that one can depend on another.

52. And it is in this way that among creatures actions and passions are mutual. For God, comparing two simple substances, finds reasons in each which oblige him to fit the other to it, and consequently that which is active in certain respects is passive from another point of view: active inasmuch as what is known distinctly in it gives a reason for what happens in the other, and passive inasmuch as the reason for what happens in it is to be found in what is known distinctly in the other.

To the four accounts of activity and passivity listed above may be added a fifth, which is found in the summary of Article 15 of the *Discourse* and also in the article itself:

5. A substance is active in so far as it is passing to a greater state of perfection and passive in so far as its perfection is being diminished.

The draft reply was not sent to Arnould, and the letter which was sent<sup>37</sup> is much less explicit on the general question of activity and passivity. Leibniz confines himself to the mind-body relation and makes only the irrelevant point that the mind expresses what happens in the body more clearly than it expresses anything else. Because of the way in which he here evades our main question, the

<sup>37</sup> G. II, pp. 73 ff.

remainder of the correspondence with Arnauld throws no further light on it.

It is not all clear how Leibniz thinks that his five views are logically related, nor, indeed, that he distinguishes them all. In this he can be contrasted with Spinoza, who puts forward only two views (corresponding to those of Leibniz numbered 1 and 2) and maintains that the second follows from the first.

Leibniz's second, fourth, and fifth views concern the nature of reality itself and tell us what the objective relation between monads is which justifies us in regarding one phenomenon as the cause of another. We may say that Leibniz is thinking on the metaphysical level when he puts forward these views. The fifth, although put forward first by Leibniz, must be regarded as an aberration. It is inconsistent with the second and, as we have seen, has highly paradoxical consequences. It does not occur in the *Monadology*. The second and the fourth accounts may be regarded as equivalent within Leibniz's system, for if a monad has clearer perceptions, God will have greater regard to it, and vice versa.

The first and third views give us criteria for applying the notions of activity and passivity to phenomena. We may say that in framing them, Leibniz is thinking at the epistemological level. They make these notions relative to the observer and the agent, respectively, and the results they yield in a given state of knowledge will not necessarily reflect any of the objective relations between monads described in the second, fourth, and fifth views. In other words, what we justifiably call a cause need not correspond to what is, for God, a reason. This accounts for the extraordinary muddle into which Leibniz falls in trying to apply his general theory to the mind-body problem. For us, according to both the first and the third views, the wound is the cause of the pain. We know how to produce it and in a sense we have a greater understanding of what is happening in the flesh than of what is happening in the mind, for the flesh can be brought under the laws of

physiology and ultimately under those of physics. For God, on the other hand, the pain must be the reason as being a conscious state. When writing his draft letter to Arnauld, Leibniz seems to have been more or less aware of these points. In the case of the ship, he suggests, we are right in thinking of the motion of the ship as the cause of the motion of the water, although in God's eyes neither is reason for the other, but the whole complex situation will presumably be explained by reference to the needs of some conscious beings.

One further complexity in Leibniz's theory is brought out in *Monadology* 52. He says there that activity and passivity are mutual in the sense that in any case of activity and passivity, each substance is active in some respects and passive in others. This can be seen as plausible in complex cases such as that of interaction between human beings. Winston Churchill and Adolf Hitler were both active and passive in relation to each other at the epistemological level, for some of the feeling and actions of each are explicable by reference to the actions of the other. Likewise at the metaphysical level, God doubtless took both into account in his over-all plan, for they were both conscious beings. But is Leibniz justified in generalizing the doctrine? At the epistemological level, it seems that explanations sometimes go one way only. The familiar case of the lighted match and the explosion serves as an illustration. And at the metaphysical level, there seems to be no reason why God should ever have more regard to a monad that is never to become conscious than to a conscious being. Indeed, in *Discourse* 35 Leibniz says that God considers spirits in preference to other creatures.<sup>38</sup>

We now have a complete picture of Leibniz's theory of activity and passivity and can compare it with that of Spinoza. It is more complex than Spinoza's, and also more confused. This is explained partly by Leibniz's distinction between reality and phenomena and partly by his wish to

<sup>38</sup> G. II, p. 14.

use his theory to give an account of the mind-body relation. There are two features in Leibniz's account which tempt us to suspect the influence of Spinoza. The first is the introduction of the notion of the passage to greater perfection together with the assertion that this is accompanied by pleasure. But this is unlikely to be a deliberate borrowing, for the use that Leibniz makes of this notion is untrue to Spinoza and confuses his own account.

The second feature which makes us suspect Spinozistic influence is Leibniz's attempt to accommodate in the same general theory the accounts of activity I have numbered 1 and 2, activity as being more clearly understood and activity as the possession of clearer understanding. This looks like a mistake, and when two authors make the same mistake we are inclined to suspect that the one influenced the other. But closer inspection shows that Spinoza's mistake is greater than Leibniz's, for he tries expressly to deduce 2 from 1, while Leibniz is more or less aware that in putting forward these two views he is talking about different things and that for human beings, at least, the result of applying the criterion implicit in 1 need not correspond with an actual state of affairs as described in 2.

The similarities between Spinoza and Leibniz are not, then, so great as Russell suggests and they could be accounted for by common origin rather than by influence. The attempt to associate activity, understanding, power, and happiness goes back to Plato and is part of a long philosophical tradition. Though Leibniz might have written as he did in the *Discourse* if he had never read Spinoza, it must be admitted that it is improbable that he would have written exactly as he did. The similarities are a little too close, and the evidence of the *De Affectibus* shows that Leibniz had Spinoza consciously in mind at least once while reflecting on these problems. By the time he wrote the *Discourse*, however, Spinoza seems to have been rather at the back of his mind and Georges Friedmann may well be right in conjecturing that Leibniz did

not read Spinoza after 1679.<sup>39</sup> Some parts of the doctrine of the *Discourse* may, instead, be an unconscious echo of Spinoza, just as Friedmann suggests that the phrase *automate spirituel* in the *New System* may be an unconscious echo of the phrase *automa spirituale* in the *Emendation of the Intellect*.<sup>40</sup> A close comparison between the *Ethics* and the *Discourse* does not provide evidence of deliberate and conscious borrowing.

In this paper I have been largely engaged in the somewhat ungracious task of pointing out the absurdities and inconsistencies to be found in the works of two great philosophers, and it may be thought that, apart from the relatively unimportant gain of having the historical record straight, there is little to be derived from the study of these theories. It may seem that they are too confused and strained even to serve as a useful warning. This view is partly justified and partly not. Inasmuch as it rests on the belief that we are unlikely in this post-positivistic, analytic age to fall into the error of premature synthesis which is characteristic of the great rationalistic systems, it is justified. Grandiose metaphysics does not now offer much temptation. But inasmuch as it rests on the belief that after Hume we thoroughly understand causation, and therefore activity and passivity, it is mistaken. These notions are obscure to us as they were to Spinoza and Leibniz, and we may still learn from their mistakes and even from their insights. In the difficult case of the mind-body relation especially, where Hume's criterion of temporal priority is rarely applicable, it is doubtful whether we have made much advance on Leibniz's suggestions that the cause is that which helps us to understand or that which we can produce in order to produce something else.

<sup>39</sup> Friedmann, *op. cit.*, p. 192.

<sup>40</sup> *Ibid.*, p. 198.





# LEIBNIZ AND NEWTON

ALEXANDRE KOYRÉ

Newton's veiled and Roger Cotes' open counterattack upon the "plenists" did not remain unanswered. If the Cartesians, properly speaking, did not react, Leibniz, in a letter to the Princess of Wales<sup>1</sup> written in November 1715, replied to the accusations formulated by Cotes by expressing to his august correspondent his misgivings concerning the weakening of religion and the spread of materialism and godless philosophies in England, where some people attributed materiality not only to souls but even to God, where Mr. Locke doubted the immateriality and the immortality of the soul, and where Sir Isaac Newton and his followers professed rather low and unworthy ideas about the power and wisdom of God. Leibniz wrote:

Sir *Isaac Newton* says, that Space is an *Organ*, which God makes use of to perceive Things by. But if God stands in need of any *Organ* to perceive Things by, it will follow, that they do not depend altogether upon him, nor were produced by him.

Sir *Isaac Newton*, and his Followers, have also a

Chapters XI and XII of *From the Closed World to the Infinite Universe* (Johns Hopkins Press, Baltimore, 1956). Reprinted by permission of the publisher.

<sup>1</sup> Wilhelmine Caroline, later Queen Caroline, was born Princess of Brandenburg-Anspach and in 1705 became the wife of George Augustus, Electoral Prince of Hanover. It was as Princess of Hanover that she became intimate with Leibniz; as Leibniz put it himself, she "inherited" him from Sophie Charlotte of Prussia.

very odd Opinion concerning the Work of God. According to their Doctrine, God Almighty wants to *wind up* his Watch from Time to Time: Otherwise it would cease to move. He had not, it seems, sufficient Foresight to make it a perpetual Motion. Nay, the Machine of God's making is so imperfect, according to these Gentlemen, that he is obliged to *clean* it now and then by an extraordinary Concourse, and even to *mend* it, as a Clockmaker mends his Work; who must consequently be so much the more unskilful a Workman, as he is often obliged to mend his Work and to set it Right. According to My Opinion, the *same* Force and Vigour remains always in the World, and only passes from one part of Matter to another, agreeably to the Laws of Nature, and the beautiful pre-established Order.<sup>2</sup>

An accusation of the kind formulated by Leibniz could not, of course, be left without refutation. Yet, as it was obviously below the dignity and standing of Sir Isaac—who, moreover, hated all polemics and public discussions—to do it himself, the task fell upon the shoulders of Dr. Samuel Clarke, the faithful pupil and friend of Newton, who translated his *Opticks* into Latin,<sup>3</sup> and, as far

<sup>2</sup> Cf. "An extract of a letter written in November 1715," §§3 and 4, published in *A Collection of papers, which passed between the late learned Mr. Leibnitz and Dr. Clarke. In the years 1715 and 1716 Relating to the Principles of Natural Philosophy and Religion. With an Appendix*, pp. 3 and 5, London, 1717. Leibniz writes, of course, in French, and Clarke, in English. But he accompanies the publication of the originals by a translation of Leibniz's "papers" into English (probably made by himself) and of his own "replies" into French (probably made by the Abbé Conti). Moreover, he adds to the text a series of footnotes with references to relevant passages in Newton's writings. This polemic is now available in the excellent edition of G. H. Alexander, *The Leibniz-Clarke correspondence*, Manchester Univ. Press, 1956; cf. also René Dugas, *La mécanique au XVII<sup>e</sup> siècle*, cap. xvi, §3, pp. 561 ff.

<sup>3</sup> The choice of Dr. Samuel Clarke was rather obvious. Dr. Clarke, Rector of St. James', Westminster, was not only a philosophical theologian—in 1704–5 he gave the Boyle Lectures—

back as 1697, stuffed with Newtonian footnotes his translation of Rohault's Cartesian *Physics*. A long-drawn-out and extremely interesting correspondence resulted, which ended only with the death of Leibniz, and which throws

---

but also was former chaplain of Queen Anne, removed, to say the truth, from this charge for lack of orthodoxy (he was practically an Arian). However, after Queen Anne's death he became an intimate of Princess Caroline with whom, at her request, he had weekly philosophical conversations in which other gentlemen interested in discussing philosophical problems participated. Thus it was only natural that, as Des Maizeaux tells us in the preface to his own French re-edition of the *Collection of papers* (*Recueil de diverses pièces sur la philosophie, la religion naturelle, l'histoire, les mathématiques etc.*, 2 vols., Amsterdam, 1720, p. II): "Madame la Princesse de Galles, accoutumée aux Recherches Philosophiques les plus abstraites et les plus sublimes fit voir cette Lettre à M. Clarke et souhaite qu'il y répondit. . . . Elle envoyait à M. Leibniz les Réponses de M. Clarke et communiquait à M. Clarke les nouvelles difficultés, ou les Instances de M. Leibniz." Indeed, Dr. Clarke as an intimate friend of Sir Isaac, and a Newtonian of long standing, could be relied upon to represent the philosophical views of his master.

In my opinion we must go even farther: it is utterly unconceivable that Clarke should accept the role of philosophical spokesman (and defender) of Newton without being entrusted by the latter to do it, nay, without having secured the collaboration of the great man, at least in the form of approval.

I am, thus, morally certain that Clarke communicated to Newton both Leibniz's letters and his own replies to them. It is indeed unthinkable that in the midst of his bitter fight with Leibniz about the priority of the invention of the calculus, Newton who "aided" both Keill and Raphson in their attacks against Leibniz, as he "aided" Des Maizeaux some years later in the preparation of his edition of the "*Collection of papers*" (the second volume of his edition carries the history of the calculus controversy by publishing translations of selected pieces of the *Commercium epistolicum*), should remain aloof and disinterested in the face of an assault upon his religious view and an accusation, practically, of atheism, by the selfsame Leibniz. As a matter of fact, the Princess of Wales informed Leibniz (Caroline to Leibniz, Jan. 10, 1716, in O. Klopp, *Die Werke von Leibniz*, Hanover, 1864-84, vol. XI, p. 71, quoted in *The Leibniz-Clarke correspondence*, Manchester Univ. Press, 1956, p. 193) that he was right in his supposition that these letters were not written without the advice

a vivid light upon the conflicting positions of the two philosophers (Leibniz and Newton) as well as upon the fundamental issues that were in question.

Thus, Dr. Clarke, though recognizing the deplorable fact that there were, in England as elsewhere, persons who denied even natural religion or corrupted it entirely, explained that it was due to the spread of false materialistic philosophies (which were also responsible for the materialization of the soul and even of God, mentioned by Leibniz); pointed out that these people were most effectively combatted by the mathematical philosophy, the only philosophy which proves that matter is the smallest and the least important part of the universe.<sup>4</sup> As for Sir Isaac Newton, he does not say that space is an organ which God uses in order to perceive things, nor that God needs any means for perceiving them. Quite the contrary, he says that God, being everywhere, perceives them by His immediate presence in the very space where they are. And it is just in order to explain the immediacy of this perception that Sir Isaac Newton—comparing God's perception of *things* with the mind's perception of *ideas*—said that infinite space is, so to speak, as the *sensorium* of the Omnipresent God.<sup>5</sup>

---

of Newton. Strange as it may seem, the importance of Clarke's papers as representing *literally* the metaphysical views of Newton has never been recognized, with the result that their study was completely neglected by the historians both of Newton and of Leibniz. Thus, for instance, L. T. More, *op. cit.*, p. 649: "It seems probable that Newton was even more exasperated by Leibniz's attack on the anti-Christian influence of the *Principia* than by the controversy over the invention of the calculus. To justify himself he guided Des Maizeaux in preparing for publication the long debate between Leibniz and Samuel Clarke on the religious significance of the Newtonian Philosophy. For this purpose he gave to the author the documents relating to the controversy, and assisted him in preparing an historical preface which reviewed the whole affair."

<sup>4</sup> Cf. Koyré, *From the Closed World to the Infinite Universe*, pp. 181-89.

<sup>5</sup> As a matter of fact (cf. Koyré, p. 209) Newton, at least once, identified space with God's *sensorium*.

From the point of view of the Newtonian, Leibniz's reproach of belittling God's power and wisdom by obliging Him to repair and to wind up the world clock is both unfair and unjustified; on the contrary, it is just by His constant and vigilant action, by conferring on the world new energy that prevents its decay into chaotic disorder and immobility, that God manifests His presence in the world and the blessing of His providence. A Cartesian, or a Leibnizian God, interested only in conserving in its being a mechanical clockwork set once and forever, and endowed, once and forever with a constant amount of energy, would be nothing better than an absent God. Clarke therefore states rather wickedly that the assimilation of the world to a perfect mechanism moving without God's intervention,

. . . is the Notion of *Materialism* and *Fate*, and tends (under pretence of making God a *Supra-Mundane Intelligence*) to exclude *Providence* and *God's Government* in reality out of the World. And by the same Reason that a *Philosopher* can represent all Things going on from the beginning of the Creation, *without* any Government or Interposition of Providence, a *Sceptick* will easily Argue still farther Backwards, and suppose that Things have from Eternity gone on (as they now do) *without* any true Creation or Original Author at all, but only what such Arguers call *All-Wise and Eternal Nature*. If a *King* had a *Kingdom* wherein all Things would continually go on *without* his Government or Interposition, or *without* his Attending to and Ordering what is done therein; It would be to *him*, merely a *Nominal Kingdom*; nor would he in reality deserve at all the Title of King or Governor. And as those Men, who pretend that in an Earthly Government Things may go on perfectly well *without* the *King himself* ordering or disposing of any Thing, may reasonably be suspected that they would like very well to set the King aside: so whosoever contends, that the Course of the World can go on *without* the Continual direction of God,

the Supreme Governor; his Doctrine does in Effect tend to exclude God out of the World.<sup>6</sup>

Confronted with Dr. Clarke's reply that rather unexpectedly placed him under the obligation to defend himself against Clarke's sly insinuations, Leibniz struck back by pointing out that "mathematical" principles are not opposed to, but identical with, those of materialism and have been claimed by Democritus and Epicurus as well as by Hobbes; that the problem dealt with is not a mathematical but a metaphysical one, and that metaphysics, in contradistinction to mere mathematics, has to be based on the *principle of sufficient reason*; that this principle, applied to God, necessarily implies the consideration of God's wisdom in planning and creating the universe, and that, *vice versa*, the neglect of this principle (Leibniz does not say so outright, yet he suggests that such is the case of the Newtonians) leads directly to the world-view of Spinoza, or, on the other hand, to a conception of God closely resembling that of the Socinians,<sup>7</sup> whose God is so utterly lacking in foresight that He has "to live from day to day." The Newtonians point out that, according to them, and in contradistinction to the materialists, matter is the least important part of the universe, which is chiefly constituted by void space. But after all, Democritus and Epicurus admitted void space just as Newton does, and if they differed from him in believing that there was much more matter in the world than there is according to Newton, they were in this respect preferable to the latter; indeed, more matter means more opportunities for God to exercise His wisdom and power, and that is a reason, or at least one of the reasons, why, in truth, there is no void space at all in the universe, and that space is everywhere full of matter.

<sup>6</sup> "Dr. Clarke's first reply," *A collection of papers . . .*, pp. 15 ff.

<sup>7</sup> The Socinians did not believe in predestination, nor in the Trinity.

But to come back to Newton. In spite of all the explanations of his friends,

I find [writes Leibniz] in express Words, in the *Appendix* to Sir Isaac Newton's *Opticks*, that *Space* is the *Sensorium* of God. But the Word *Sensorium* hath always signified the *Organ* of Sensation. He, and his Friends, may now, if they think fit, explain themselves quite otherwise: I shall not be against it.<sup>8</sup>

And as for the accusation of making the world a self-sufficing mechanism and reducing God to the status of an *intelligentia supra-mundana*, Leibniz replies that he never did so, that is, that he never denied that the created world needed God's continuous concourse, but only asserted that the world is a clock that does not need mending, since, before creating it, God saw, or foresaw, everything; and that he never excluded God from the world, though he did not, as his adversaries seem to do, transform Him into the soul of the world. Indeed, if God has, from time to time, to correct the natural development of the world, He can do it either by supernatural means, that is, by a miracle (but to explain natural things and processes by miracles is absurd); or He can do it in a *natural* way: in this case God is included in nature and becomes *anima mundi*. Finally,

The comparison of a King, under whose Reign every thing should go on without his Interposition, is by no means to the present Purpose; since God preserves every thing continually, and nothing can subsist without him. His Kingdom therefore is not a *Nominal* one.<sup>9</sup>

Otherwise we should have to say that a Prince who has so well educated his subjects that they never infringe his laws is a Prince only in name.

Leibniz does not express, as yet, his ultimate objections

<sup>8</sup> "Mr. Leibniz's second paper," *ibid.*, p. 25.

<sup>9</sup> *Ibid.*, p. 33.

to Newton; the fundamental opposition appears nevertheless pretty clearly: the God of Leibniz is not the Newtonian Overlord who makes the world as He wants it and continues to act upon it as the Biblical God did in the first six days of Creation. He is, if I may continue the simile, the Biblical God on the Sabbath Day, the God who has finished His work and who finds it good, nay, the very best of all possible worlds, and who, therefore, has no more to act upon it, or in it, but only to conserve it and to preserve it in being. This God is, at the same time—once more in contradistinction to the Newtonian one—the supremely rational Being, the principle of sufficient reason personified, and for this very reason, He can act only according to this principle, that is, only in order to produce the greatest perfection and plenitude. He cannot therefore—any more than the God of Giordano Bruno with whom (in spite of His being a mathematician and a scientist) He has a great deal in common—either make a finite universe, or suffer void space either inside or outside the world.

It is hardly surprising that, having read Leibniz's answer to his criticism, Dr. Clarke felt himself compelled to reply: Leibniz's hints were too damaging,<sup>10</sup> his tone too superior, and, moreover, his insistence on the implications of the term "*sensorium*," somewhat hastily and perhaps unhappily used by Newton, far too menacing to allow Clarke to leave Leibniz in the position of having had the last word.

Starting thus from the beginning, Clarke explains that

<sup>10</sup> Especially his allusion to Socinianism, because, as a matter of fact both Sir Isaac Newton and Dr. Samuel Clarke were much nearer to Socinianism than to the teaching of the Established Church: neither of them, indeed, accepted the Trinitarian conception of God; they were both—as also John Locke—Unitarians; cf. H. McLachlan, *The religious opinions of Milton, Locke and Newton*, Manchester, 1941. On Newton's metaphysical and religious views, cf. Hélène Metzger, *Attraction universelle et religion naturelle*, Paris, 1938, and E. W. Strong, "Newton and God," *Journal of the History of Ideas*, vol. xiii, 1952.



the "principles of mathematical philosophy" are by no means identical with, but radically opposed to, those of materialism, precisely in that they deny the possibility of a purely naturalistic explanation of the world and postulate—or demonstrate—its production by the purposeful action of a free and intelligent Being. And as for Leibniz's appeal to the principle of sufficient reason, it is true that nothing exists without sufficient reason: where there is no cause, there is also no effect; yet the said sufficient reason can be simply the will of God. Thus, for instance, if one considers why a system, or a certain piece, of matter is created in one place, and another one in another, and not *vice versa*, there can be no other reason for that than the pure will of God. If it were not so—that is, if the principle of sufficient reason were taken absolutely, as Leibniz does—and if this will could never act unless predetermined by some cause, as a balance cannot move unless some weight make it turn, God would have no liberty of choice, which would be replaced by necessity.

As a matter of fact, Dr. Clarke subtly suggests that Leibniz, indeed, deprives his God of all liberty. Thus he forbids him to create a limited quantity of matter . . . yet by the same argument one could prove that the number of men or of any kind of creatures whatsoever should be infinite (which, of course, would imply the eternity and necessity of the world).

As for the (Newtonian) God, He is neither an *intelligentia mundana*, nor an *intelligentia supra-mundana*; nor is He an *anima mundi*, but an intelligence which is everywhere, in the world and outside it, in everything, and above everything. And He has no organs as Leibniz persists in insisting.<sup>11</sup>

The Word *Sensory* does not properly signify the *Organ*, but the *Place* of Sensation. The *Eye*, the *Ear*, etc. are *Organs*, but not *Sensoria*.<sup>12</sup>

<sup>11</sup> Or, at least, proclaims.

<sup>12</sup> "Dr. Clarke's second reply," *ibid.*, p. 41. *Intelligentia supra-mundana*, or more exactly, *extra mundana*, is an expression of Leibniz; cf. *Théodicée*, §217.

Moreover, Newton does not say that place is a *sensorium*, but calls it thus only by way of comparison, in order to indicate that God really and effectively perceives things in themselves, where they are, being present to them, and not purely transcendent—present, acting, forming and re-forming (which last term, just as the term “correcting,” must be understood in respect to us, or to God’s works, not indeed as implying change in God’s designs): thus if

the present Frame of the Solar System (for instance) according to the present Laws of Motion, will in time *fall into Confusion*; and perhaps, after That, will be *amended* or put into a *new Form*

it will be new in respect to us, or to itself, not new in respect to God whose eternal plan implied just such an intervention in the normal course of events.<sup>13</sup> To forbid God to do that, or to declare all God’s action in the world to be miraculous or supernatural, means excluding God from the government of the world. It may be, concedes Clarke, that in this case He would still remain its Creator; He would certainly no longer be its governor.

The second paper of Dr. Clarke made Leibniz angry. Why, he complains, did they grant me this important principle that *nothing happens without a sufficient reason why it should be so rather than otherwise*, but they grant it only in words, not in fact. Moreover, they use against me one of my own demonstrations against *real absolute space*, that idol (in the sense of Bacon) of some modern Englishmen. Leibniz is right, of course: to say, as Clarke does, that God’s will is, as such, a sufficient reason for anything, is to reject the principle, and to reject also the thorough-going rationalism which supports it. And to use the conception of homogeneous, infinite, real space as a basis for the demonstration that God’s free (that is, unmotivated, irrational) will can, and must, be considered

<sup>13</sup> “Dr. Clarke’s second reply,” *ibid.*, p. 45.

as a "sufficient reason" for something, is to insult the intelligence; and to force Leibniz to discuss the problem of space (something he did not very much want to do):

These Gentlemen maintain therefore, that *Space* is a *real absolute Being*. But this involves them in great difficulties; for such a *Being* must needs be *Eternal* and *Infinite*. Hence Some have believed it to be *God himself*, or, one of his Attributes, his Im-mensity. But since Space consists of *Parts*, it is not a thing which can belong to God.<sup>14</sup>

All that, as we know, is perfectly true. Nevertheless Leibniz's criticism of the Newtonian or, more generally, the absolutist conception of space, forgets that those who hold it deny that space consists of parts—*partes extra partes*—and assert, on the contrary, that it is indivisible. Leibniz is perfectly right, too, in asserting that

*Space* is Something absolutely *Uniform*; and, without the Things placed in it, *One Point* of Space does not absolutely differ in any respect whatsoever from *Another Point* of Space. Now from hence it follows, (supposing Space to be Something in it self, besides *the Order of Bodies among themselves*,) that it is impossible there should be a Reason, why God, preserving the same Situations of Bodies among themselves, should have placed them in Space after *one certain particular manner*, and not otherwise; why every thing was not placed the *quite contrary way*, for instance, by changing East into West.<sup>15</sup>

Yet the conclusions drawn by Leibniz and by Clarke from the same, hypothetically admitted facts are diametrically opposed. Leibniz believes that in this case, that is, in the absence of reasons for choice, God would not be able to act; and *vice versa*, from the fact of the choice and of acting, he deduces the rejection of the fundamental hypothesis, that is, the existence of an absolute space, and

<sup>14</sup> "Mr. Leibniz's third paper," *ibid.*, p. 57.

<sup>15</sup> *Ibid.*, p. 59.

proclaims that space, like motion, is purely relative, or even more, is nothing else but the order of coexistence of bodies and would not exist if there were none, just as time is nothing else but the order of succession of things and events, and would not exist if there were no things or events to be ordered.

The Newtonian, on the other hand, concludes the freedom of God, that is, the non-necessity of a determining reason or motive for God's choice and action. For Leibniz, of course, this unmotivated choice is vague indifference, which is the contrary of true freedom; but for the Newtonian, it is the absolutely motivated action of the Leibnizian God which is synonymous with necessity.

The Newtonians assert that, left to itself, the motive force of the universe would decrease and finally disappear. But, objects Leibniz,

if *active Force* should *diminish* in the Universe, by the Natural Laws which God has established; so that there should be need for him to give a *new Impression* in order to restore that Force, like an Artist, Mending the Imperfections of his Machine; the Disorder would not only be with respect to *Us*, but also with respect to *God himself*. He *might have* prevented it and taken better Measures to avoid such an Inconvenience: And therefore, indeed, he has actually done it.<sup>16</sup>

The Newtonians protest against Leibniz's assertion that they make nature a perpetual miracle. And yet, if God wanted to make a free body revolve around a fixed center, though not acted upon by any other creature, He would not be able to achieve it without a miracle since such a motion cannot be explained by the nature of bodies. For a free body naturally moves away from a curved line along its tangent. Thus mutual attraction of bodies is something miraculous as it cannot be explained by their nature.

<sup>16</sup> "Mr. Leibniz's third paper," *ibid.*, p. 69.

From now on the discussion broadens and deepens. The "papers" become longer and longer. The skirmish develops into a pitched battle. Leibniz and Clarke go at each other hammer and tongs. It is true that, to a large extent, they simply repeat, or elaborate, the same arguments—philosophers, I have already said it, seldom, if ever, convince each other, and a discussion between two philosophers resembles as often as not a "dialogue de sourds"—and yet they come more and more into the open, and the fundamental issues come more and more to the foreground.

Thus, for instance, in his *third paper*, Dr. Clarke re-objects to Leibniz that it is preposterous to subject God to the law of strict motivation and to deprive Him of the faculty of making a choice between two identical cases. Indeed, when God creates a particle of matter in one place rather than in another, or when He places three identical particles in a certain order rather than in another, He cannot have any reason for doing so except His pure will. The perfect equivalence of the cases, a consequence of the identity of material particles and of the isomorphism of space, is no more a reason for denying God's freedom of choice than it is an objection to the existence of an absolute, real and infinite space. And as for its relation to God, misrepresented by Leibniz, Clarke states the correct, Newtonian, that is, More's, doctrine:

*Space* is not a *Being*, an eternal and infinite *Being*, but a *Property* [attribute], or a consequence of the Existence of a *Being* infinite and eternal. *Infinite Space*, is *Immensity*. But *Immensity* is not *God*: And therefore Infinite Space, is not *God*. Nor is there any Difficulty in what is here alleged about Space having *Parts*. For Infinite Space is One, absolutely and essentially indivisible: And to suppose it *parted*, is a contradiction in Terms; because there must be Space in the *Partition it self*; which is to suppose it *parted*, and yet *not parted* at the same time. The *Immensity* or *Omnipresence* of *God*, is no more a dividing of his Substance into *Parts*; than his *Dura-*

*tion*, or continuance of existing is a dividing of his existence into *Parts*. There is no difficulty here, but what arises from the *figurative* Abuse of the Word, *Parts*.<sup>17</sup>

It is not Newton's admission, it is Leibniz's denial, of absolute space that leads to difficulties and absurdities. Indeed, if space were only relative, and nothing but the order and arrangement of things, then a mere displacement of a system of bodies from one place to another (for instance, of our world to the region of the farthest fixed stars) would be no change at all, and it would follow therefrom that the two places would be the same place. . . .<sup>18</sup> It would follow also that, if God should move the whole world in a straight line, then, whatever the speed of this motion, the world would remain in the same place, and that nothing would happen if that motion were suddenly stopped.<sup>19</sup>

And if *time* were only an order of succession, then it would follow that, if God had created the world some millions of years earlier, it would, nevertheless, have been created at the same time.

We shall see in a moment what Leibniz has to object to in Dr. Clarke's reasonings (he will find them meaningless); as for us, we have to admit that they are by no means as absurd as may seem at first glance; they only

<sup>17</sup> "Dr. Clarke's third reply," *ibid.*, p. 77. Dr. Clarke uses the term "property" in his own "replies" as well as in the translation of Leibniz's "papers"—and one understands full well why he does not use the more correct one, "attribute"—just because Leibniz has mentioned Spinoza. But Leibniz himself *uses* the term "attribute"; moreover the French translation of Clarke's "replies," reviewed and acknowledged by Clarke himself, uses "attribute" for "property."

<sup>18</sup> Dr. Clarke's example is rather bad as, in this case, there would be a *relative* displacement of "our world" in respect to the fixed stars.

<sup>19</sup> The use of the principle of inertia in the discussion of the old problem whether God can move the world in a straight line (cf. my paper quoted Koyré, cap. III, n. 43) is rather ingenious.

represent, or imply, a formal breach (already accomplished by Henry More) with the main philosophico-theological tradition to which Leibniz remains fundamentally faithful: the Newtonians, as we know, do not attach time and space to creation but to God, and do not oppose God's eternity and immensity to sempiternity and spatial infinity, but, on the contrary, identify them. Clarke thus explains:

God, being *Omnipresent*, is really *present* to everything, *Essentially* and *Substantially*. His Presence *manifests* it self indeed by its *Operation*, but it could not operate if it was not *There*.<sup>20</sup>

Nothing, indeed, can act without being *there*; not even God: there is no action at a distance; not even for God. Yet as God is everywhere "there," He can, and does, act everywhere, and therefore, Leibniz's assertion to the contrary notwithstanding, He can achieve without miracle, but by His own—or some creature's—action that a body be deflected from the tangent and can even make a body turn around a fixed center instead of running away along the tangent; whether God in order to produce this effect acts Himself, or through a creature, is of no avail: in neither case would it be a miracle as Leibniz pretends.

It is clear that, for Clarke, Leibniz's assertion—as well as his rejection as "imperfection" of the diminution of the moving power in the world—is based on the assumption of the necessary self-sufficiency of nature; a conception, as we know, utterly unacceptable for the Newtonians who see in it a means of excluding God from the world.

But let us come back to Clarke's objection to Leibniz's conception of space. The first argument of Samuel Clarke is not very good, as the displacement imagined by him would be not only absolute but also relative to the aggregate of the fixed stars. But the second one is perfectly valid: in the infinite universe of Newtonian physics any,

<sup>20</sup> "Dr. Clarke's third reply," *ibid.*, p. 85.

and every, body can be considered as possessing—or not possessing—a uniform, rectilinear motion in a certain direction, and though the two cases would be perfectly indistinguishable one from another, the passage from the one to the other would be accompanied by very determined effects. And if the motion were not uniform but accelerated, we should even be able to perceive it (something that would not happen if motion and space were only relative): all that is an inevitable consequence of the Newtonian principle of inertia.

Clarke, of course, does not stop here. For him—as for Bentley or Raphson—the radical distinction of matter and space implies the belief in the possible and perhaps even real finitude of the universe. Why, indeed, should matter, which occupies so small a part of space, be infinite? Why should we not admit, on the contrary, that God has created a determined amount of it, just as much as was needed for this very world, that is, for the realization of the aims that God had in creating it?

The *fourth* paper of Leibniz leads us directly to the deepest metaphysical problems. Leibniz starts by asserting with the utmost energy the absolute panarchy of the principle of sufficient reason: no action without choice, no choice without determining motive, no motive without a difference between the conflicting possibilities; and therefore—an affirmation of overwhelming importance—no two identical objects or equivalent situations are real, or even possible, in the world.<sup>21</sup>

As for space, Leibniz reasserts just as vigorously that space is a function of bodies and that, where there are no bodies, there is also no space.

The same reason, which shows that *extra-mundane* Space is *imaginary*, proves that *All empty Space* is an *imaginary* thing; for they differ only as greater and less.<sup>22</sup>

<sup>21</sup> For Leibniz reality and individuality are inseparable.

<sup>22</sup> "Mr. Leibniz's fourth paper," *ibid.*, p. 97.



This does not mean, of course, that, according to Leibniz, the world and space are both limited in extension, as was thought by the medieval philosophers who spoke about the "imaginary" space "outside" of the world; but, on the contrary, that void space, be it outside or inside the world, is pure fiction.<sup>23</sup> Space, everywhere, is full; indeed,

There is no *possible* Reason, that *can limit* the quantity of Matter; and therefore such limitation can have no place.

Now, let us fancy a *Space* wholly *empty*, God *could* have placed some Matter in it, without derogating in any respect from all other things; Therefore he hath actually placed some Matter in That Space: Therefore, there is no Space wholly *Empty*: Therefore All is full.<sup>24</sup> The same Argument proves that there is no Corpuscle, but what is Subdivided.<sup>25</sup>

Moreover, the idea of void space is a metaphysically impossible idea, against which Leibniz erects objections analogous to, and probably derived from, those that Descartes opposed to Henry More:

If Space is a property or Attribute, it must be the Property of some *Substance*. But *what Substance* will that *Bounded* empty Space be an Affection or Property of, which the Persons I am arguing with, suppose to be between Two Bodies?<sup>26</sup>

This is a reasonable question, but a question to which Henry More had already given an answer, which Leibniz however chooses to disregard. He continues therefore:

If *Infinite Space* is *Immensity*, *finite Space* will be the Opposite to Immensity, that is, 'twill be *Mensur-*

<sup>23</sup> *Ibid.*, p. 103.

<sup>24</sup> Thus, practically, Leibniz and Descartes are in full agreement.

<sup>25</sup> "Mr. Leibniz's fourth paper," *ibid.*, pp. 115 ff.

<sup>26</sup> *Ibid.*

*ability*, or *limited Extension*. Now Extension must be the Affection of some thing extended. But if That Space be empty, it will be an Attribute *without a Subject*, an Extension without any thing extended. Wherefore by making Space a *Property*, the Author falls in with My Opinion, which makes it an Order of things, and not any thing absolute.<sup>27</sup>

By no means; of course there is no attribute without substance; but as we know, for the "author" that substance is God. Leibniz does not admit it, and develops the awkward consequences of the absolutist conception:

If Space is an absolute *reality*; far from being a *Property* or an Accident opposed to Substance, it will have a *greater reality* than *Substances* themselves. God cannot destroy it, nor even change it in any respect. It will be not only immense in the whole, but also *Immutable* and *Eternal* in every part. There will be an infinite number of Eternal things besides God.<sup>28</sup>

As we know, it is just what the Newtonians, or the Henry More-ists assert, denying, of course, that space is something "besides" God. But their teaching, according to Leibniz, implies contradictions:

To say that *Infinite Space* has no *Parts*, is to say that it does not consist of *finite Spaces*; and that Infinite Space might subsist, though all finite Spaces should be reduced to nothing. It would be as if one

<sup>27</sup> *Ibid.* Leibniz will mention Henry More in his fifth paper, n. 48: "To conclude. If the space (which the author fancies) void of bodies is not altogether empty: what is it then full of? Is it full of extended spirits perhaps, or immaterial substances, capable of extending and contracting of themselves; which move therein and penetrate each other without any inconveniency, as the shadows of two bodies penetrate one another upon the surface of a wall? Methinks I see the revival of the odd imaginations of Dr. Henry More (otherwise a learned and well meaning man) and of some others who fancied that those spirits can make themselves impenetrable whenever they please."

<sup>28</sup> *Ibid.*

should say, in the *Cartesian* Supposition of a material extended unlimited World that such a World might subsist, though all the Bodies of which it consists, should be reduced to nothing.<sup>29</sup>

By no means; Leibniz does not understand the difference between his own conception of space—a lattice of quantitative relations—and that of Newton, for whom space is a unity which precedes and makes possible all relations that can be discovered in it. Or, more probably, since it is rather difficult to believe that there was something that Leibniz did not understand, he *does* understand, but does not admit the conception of Newton. Thus he writes:

If *Space* and *Time* were anything absolute, that is, if they were any thing else, besides certain *Orders* of Things; then indeed my assertion would be a *Contradiction*. But since it is not so, the Hypothesis [*that Space and Time are any thing absolute*] is contradictory, that is 'tis an impossible Fiction.<sup>30</sup>

As for the examples and counter-objection of Dr. Clarke, Leibniz deals with them in a rather off-hand manner. Thus he reasserts that those who fancy that the active powers decrease by themselves in the world do not know the principal laws of nature; that to imagine God moving the world in a straight line is to compel Him to do something wholly meaningless, an action without rime or reason, that is, an action that it is impossible to attribute to God. Finally, concerning attraction, which Clarke endeavors to present as something natural, Leibniz repeats:

'Tis also a supernatural thing, that Bodies should *attract* one another at a distance, without any intermediate Means; and that a Body should move round, without receding in the Tangent, though nothing hin-

<sup>29</sup> *Ibid.*

<sup>30</sup> *Ibid.*, p. 101.

ders it from so receding. For these Effects cannot be explained by the Nature of things.<sup>31</sup>

Leibniz's repeated appeal to the principle of sufficient reason did not, needless to say, convince or even appease Clarke. Quite the contrary: it seemed to him to confirm his worst apprehensions. In the *fourth* reply he writes:

This Notion leads to universal *Necessity and Fate*, by supposing that *Motives* have the same relation to the *Will of an Intelligent Agent*, as *Weights* have to a *Balance*; so that of *two* things absolutely indifferent, an Intelligent Agent can no more choose *Either*, than a Balance can move it self when the *Weights* on both sides are *Equal*. But the *Difference* lies here<sup>32</sup>

in the distinction, disregarded by Leibniz, between a free and intelligent being, who is a self-determining agent, and a mere mechanism, which, in the last analysis, is always passive. If Leibniz were right about the impossibility of a plurality of identical objects, no creation would ever have been possible; matter, indeed, has one identical nature, and we can always suppose that its parts have the same dimension and figure.<sup>33</sup> In other terms: the atomic theory is utterly incompatible with Leibniz's conception; which is, of course, perfectly true. For Leibniz there cannot be in the world two identical objects; moreover Leibniz, like Descartes, denies the existence of last, indivisible, hard particles of matter, without which Newtonian physics is inconceivable.

Leibniz's linking space (and time) with the world, and his assertion of the fictitious (imaginary) character of void space and "void" time seem to Clarke utterly unreasonable; and also full of danger. It is perfectly clear that

*Extra-mundane Space*, (if the material would be

<sup>31</sup> "Mr. Leibniz's fourth paper," *ibid.*

<sup>32</sup> "Dr. Clarke's fourth reply," *ibid.*, p. 121.

<sup>33</sup> We even have to suppose it if we want to link atomism with mathematical philosophy.

Finite in its Dimensions,) is not *imaginary*, but *Real*. Nor are void Spaces in the World, merely imaginary.<sup>34</sup>

It is the same in respect to time:

Had God created the World *but This Moment*, it would not have been created at the Time it was created.<sup>35</sup>

The denial of the possibility for God to give motion to the world is no more convincing:

And if God *has made* (or *can make*) Matter Finite in Dimensions, the *material Universe* must consequently be in its Nature *Moveable*; For nothing that is finite, is immoveable.<sup>36</sup>

Leibniz's criticism of the concept of void space is, for Clarke, based on a complete misunderstanding of its nature and on misuse of metaphysical concepts:

*Space* void of Body, is the Property [attribute] of an *incorporeal* Substance. Space is not *Bounded* by *Bodies*, but exists equally *within* and *without* Bodies. Space is not *inclosed between* Bodies; but Bodies, existing in unbounded Space, are, *themselves only*, terminated by their own Dimensions.

Void Space, is not an *Attribute without a Subject*, because, by *void Space*, we never mean *Space void of Every thing*, but void of *Body* only. In All void *Space*, God is *certainly* present, and *possibly* many other Substances which are not Matter; being neither *Tangible*, nor Objects of any of Our Senses.

*Space* is not a *Substance*, but a *Property* [attribute]; And if it be a *Property* [attribute] of That which is necessary, it will consequently (as all *other* Properties [attributes] of That which is necessary must do), exist *more necessarily*, though it be not *itself* a Substance, than those *Substances Themselves* which

<sup>34</sup> *Ibid.*, p. 125.

<sup>35</sup> *Ibid.*

<sup>36</sup> *Ibid.*

are *not necessary*. Space is immense, and immutable, and eternal; and so also is *Duration*. Yet it does not at all from hence follow, that any thing is eternal *hors de Dieu*. For *Space* and *Duration* are not *hors de Dieu*, but are *caused by*, and are *immediate* and *necessary Consequences* of His Existence. And without them, his *Eternity* and *Ubiquity* (or *Omnipresence*) would be taken away.<sup>37</sup>

Having thus established the ontological status of space as an attribute of God, Clarke proceeds to the demonstration that its attribution to God does not constitute a slur on His perfection: thus it does not make God divisible. Bodies are divisible, that is, can be broken up into parts,

but infinite Space, though it may by Us be *partially apprehended*, that is, may in our Imagination be conceived as composed of *Parts*; yet Those *Parts* (*improperly* so called) being *essentially indiscernible*<sup>38</sup> and *immoveable* from each other, and not *partable* without an express Contradiction in Terms, *Space* consequently is in itself *essentially One*, and *absolutely indivisible*.<sup>39</sup>

It is this space which is a precondition of motion; and motion in the true and full sense of the word, is absolute motion, that is, motion in respect to this space, in which places, though perfectly similar, are nevertheless different. The reality of this motion proves, at the same time, the reality of absolute space:

It is largely insisted on by Sir Isaac Newton in his *Mathematical Principles* (Definit. 8) where, from the Consideration of the *Properties*, *Causes* and *Effects* of Motion, he shows the difference between *real Motion*, or a Bodie's being carried from one part of Space

<sup>37</sup> "Dr. Clarke's fourth reply," *ibid.*, p. 127.

<sup>38</sup> It is rather interesting to see Dr. Clarke use Henry More's famous concept and term.

<sup>39</sup> *Ibid.*, p. 131.

to another; and *relative Motion*, which is merely a change of the *Order* or *Situation* of Bodies with respect to each other.<sup>40</sup>

The problem of time is exactly parallel to that of space:

It was no *impossibility* for God to make the World sooner or later than he did: Nor is it at all *impossible* for him to destroy it sooner or later than it shall actually be destroyed. As to the Notion of the World's *Eternity*; They who suppose *Matter* and *Space* to be the same, *must* indeed suppose the World to be not only *Infinite* and *Eternal*, but *necessarily* so; even as necessarily as *Space* and *Duration*, which depend not only on the *Will*, but on the *Existence* of God. But they who believe that God created *Matter* in what *Quantity*, and at what particular *Time*, and in what particular *Spaces* he *pleased*, are here under no difficulty. For the *Wisdom* of God may have *very good reasons* for creating *This World*, at *That Particular Time* he did.<sup>41</sup>

Clarke's reasoning follows the well-trodden path: infinity implies necessity, and therefore:

That *God Cannot limit the Quantity of Matter*, is an Assertion of too great consequence, to be admitted without *Proof*. If he cannot limit the *Duration* of it neither, then the material World is both infinite and eternal *necessarily* and *independently upon God*.<sup>42</sup>

Thus we see it once more: the acceptance of absolute space as an attribute of God and as the universal container or receptacle of everything is the means—the only one—to avoid infinity, that is, self-sufficiency of matter, and to save the concept of creation:

*Space* is the *Place* of *All Things*, and of *All Ideas*: Just as *Duration* is the *Duration* of *All Things*, and of *All*

<sup>40</sup> *Ibid.*, p. 127.

<sup>41</sup> *Ibid.*, p. 135.

<sup>42</sup> *Ibid.*, p. 139.

*Ideas*. . . . This has no Tendency to make God *the Soul of the World*.<sup>43</sup>

Far from making God immersed in the world and thus, as Leibniz insinuates, dependent upon the world, the Newtonian conception is, according to Clarke, the only one that makes Him fully and truly independent of it; fully and truly free:

There is no *Union* between God and the *World*. The *Mind of Man* might with greater propriety be stiled *The Soul of the Images of things which he perceives*, than God can be stiled *the Soul of the World*, to which he is *present* throughout, and *acts upon it* as he pleases, without being *acted upon by it*.<sup>44</sup>

And it is just because of this independence of God from the world that

. . . If no *Creatures* existed, yet the *Ubiquity* of God, and *Continuance of his Existence*, would make *Space* and *Duration* to be exactly the same as they are *Now*.<sup>45</sup>

Finally, coming back to Leibniz's persistence in misunderstanding Newton's theory of attraction and in wanting to make it a miracle, Clarke (who pointed out that Leibniz's own theory of the "pre-established harmony" between the non-communicating and non-acting-upon-each-other mind and body has much more right to imply a perpetual miracle) explains,

That *One Body* should *attract* another *without any intermediate Means*, is indeed not a *Miracle*, but a *Contradiction*: For 'tis supposing something to *act* where it is *not*. But the *Means* by which Two Bodies attract each other, may be *invisible* and *intangible*, and of a different nature from *mechanism*; and yet,

<sup>43</sup> "Dr. Clarke's fourth reply," *ibid.*, p. 139.

<sup>44</sup> *Ibid.*, p. 141.

<sup>45</sup> *Ibid.*, p. 149.



acting regularly and constantly, may well be called *natural*; being much less wonderful than *Animal-motion*, which yet is *never* called a *Miracle*.<sup>46</sup>

Indeed, it is only from the point of view of the Cartesio-Leibnizian rigid dualism of mind and body, with its negation of all intermediate entities and consequent reduction of material nature to a pure, self-sustaining and self-perpetuating mechanism, that the intervention in nature of non-mechanical and therefore non-material agencies becomes a miracle. For Clarke, as for Henry More before him, this dualism is, of course, unacceptable. Matter does not constitute the whole of nature, but is only a part of it. Nature, therefore, includes both mechanical (*stricto sensu*) and non-mechanical forces and agencies, just as "natural" as the purely mechanical ones, material as well as immaterial entities which "fill" and pervade space and without which there would be no unity or structure in the world, or better to say, there would not be a world.

The world, of course, is not an organism, like the animal, and possesses no "soul." Yet it can no more be reduced to pure mechanism than the animal, in spite of Descartes.

The vigorous (or, from Leibniz's point of view, obstinate) defense by Dr. Clarke of his (untenable) position; the assurance with which he not only accepted the (absurd and damaging) consequences deduced by Leibniz from his premises—the eternity of space—but even went beyond them by openly proclaiming that space (and time) were necessary and uncreated attributes of God; the lack of insight (or perfidy) with which he persisted in misinterpreting and misrepresenting Leibniz's principle of sufficient reason by identifying the supreme freedom of his supremely perfect God, unable to act except according to His supreme wisdom (that is, for the realization of the absolutely best universe unerringly recognized by Him

<sup>46</sup> *Ibid.*, p. 151.

among the infinite number of possible ones), with the fatality, necessity and passivity of a perfect mechanism, convinced Leibniz that he had to devote even more space and effort to the refutation of his adversary; and to the correction of the image that the latter presented of Leibniz's own views.

Thus the *fifth* (and last) paper addressed by Leibniz to the Princess of Wales became a lengthy treatise, the full analysis of which would lead us too far from our topic. It is, for us, sufficient to state that it starts with an admirable explanation of the difference between a *motive*, which inclines without compelling and thus preserves the spontaneity and the freedom of the subject, and a real cause, which necessarily produces its effect, and of the infinite distance that separates the moral—that is, free—necessity of a fully motivated action from the unfree and passive necessity of a mechanism.

Freedom, indeed, for Leibniz as for most philosophers, means doing what is good, or best, or what one ought to do, not simply doing what one wants to.<sup>47</sup> The laymen, alas—and Newton is no better than they—cannot make that distinction; they do not recognize freedom in the absolute determination of God's action. The laymen, and the theologians, therefore, accuse the philosophers of rejecting freedom in favor of necessity, and attribute to God actions utterly unworthy of Him. It is, however, evident that it is unreasonable to ask God to act in a purposeless irrational manner even if, strictly speaking, He is able—being all-powerful—to perform such an action. Thus, for instance:

Absolutely speaking, it appears that God *can* make the material Universe *finite* in Extension; but the contrary appears more agreeable to his Wisdom.<sup>48</sup>

And it is, of course, even less "agreeable to his Wisdom"

<sup>47</sup> This latter behavior is, more often than not, branded as "arbitrariness."

<sup>48</sup> "Mr. Leibniz's fifth paper," *ibid.*, p. 181.

to move the world in a straight line—why, indeed, should God do such a meaningless thing?

And therefore the Fiction of a material finite Universe, moving forward in an infinite empty Space cannot be admitted. It is altogether unreasonable and *impracticable*. For, besides that there is *no real Space* out of the material Universe, such an Action would be without any Design in it: It would be working without doing any thing, *agendo nihil agere*. There would happen *no Change*, which could be observed by Any Person whatsoever. These are Imaginations of *Philosophers who have incomplete notions*, who make Space an absolute Reality.<sup>49</sup>

Leibniz had already said it in his preceding paper, and even in stronger terms. Yet, in that paper he did not tell us *all* his reasons for rejecting this kind of motion. He did not mention precisely the most important one, namely that such a motion would be unobservable. It is perfectly clear that, if we accept the principle of observability, absolute motion, or at least absolute uniform motion in a straight line, which everybody agrees to be unobservable, will be ruled out as meaningless, and only relative motion will be acceptable. Yet in that case, the Newtonian formulation of the principle of inertia, stating that a body remains in its status of rest or uniform motion irrespective of what happens to others, and would remain in its status of motion or rest even if no other body existed, or if all of them were destroyed by God, will have to be rejected as meaningless and therefore impossible. But as it is only in such a case that the principle of inertia is fully valid, it is not only Newton's formulation of it, but the principle itself that becomes meaningless. These are rather far-reaching consequences of an innocent-looking principle, fully confirmed by the recent discussions about relativity, that are, as a matter of fact, an aftermath of the largely forgotten discussions of the XVIIth century.

<sup>49</sup> *Ibid.*

Leibniz, of course, does not require that any and every motion be *actually* observed; yet, according to him, it must be possible to do so, and that for a rather surprising reason, a reason that shows us the depth of Leibniz's opposition to Newton, and the fidelity of Leibniz to old Aristotelian conceptions which modern science has been at such pains to reject and to reform: for Leibniz, indeed, motion is still conceived as a *change*, and not as a *status*:

. . . Motion does not indeed depend upon being *Observed*; but it does depend upon being *possible to be Observed*. There is no *Motion*, when there is no *Change* that can be *Observed*. And when there is no *Change that can be Observed*, there is no *Change at all*. The contrary Opinion is grounded upon the Supposition of a real absolute Space, which I have demonstratively confuted by the Principle of the want of a *sufficient Reason* of things.<sup>50</sup>

The principle of observability confirms the relative character of motion and space. But relations—another far-reaching statement—have no “real,” but only an “ideal,” existence. Therefore,

since *Space* in it self is an *Ideal* thing, like *Time*; *Space out of the World* must needs be imaginary, as the *Schoolmen* themselves have acknowledged. The case is the Same with empty *Space within* the *World*; which I take also to be imaginary, for the reason before alleged.<sup>51</sup>

The Schoolmen, to tell the truth, meant something quite different, and Leibniz knows it better than anyone: they conceived the world as finite and wanted to deny the existence of real space (and time) outside the world—Leibniz, on the contrary, denies the limitation of the universe. But in a sense he is right to appeal to them: for both time and space are intramundane and have no existence

<sup>50</sup> “Mr. Leibniz’s fifth paper,” *ibid.*, p. 211.

<sup>51</sup> *Ibid.*, p. 183.

outside—or independently from—the created world. How, indeed, could time be something in itself, something real or even eternal?

It cannot be said, that *Duration* is Eternal; but that *Things*, which continue always, are Eternal. Whatever exists of Time and Duration, perishes continually: And how can a thing exist Eternally, which (to speak exactly) does never exist at all? For, how can a thing exist, whereof no Part does ever exist? Nothing of Time does ever exist, but Instants; and an Instant is not even it self a part of Time. Whoever considers These Observations, will easily apprehend that Time can only be an Ideal thing. And the Analogy between Time and Space, will easily make it appear that the one is as merely Ideal as the other.<sup>52</sup>

Yet we must not unduly stress the parallelism between space and time in order not to be conduced to admit either the infinity of time, that is, the eternity of the world, or the possibility of a finite universe:

. . . the World's having a Beginning, does not derogate from the Infinity of its Duration *a parte post*; but Bounds of the Universe would derogate from the Infinity of its Extension. And therefore it is more reasonable to admit a Beginning of the World, than to admit any Bounds of it; that the Character of its infinite Author, may be in Both Respects preserved.

However, those who have admitted the *Eternity* of the World, or, at least (as some famous Divines have done), *the possibility* of its Eternity, did not, for all that, deny its dependence upon God; as the Author here lays to their Charge, without any Ground.<sup>53</sup>

The Newtonians, of course, do not accept these Leibnizian "axioms" (and we have just seen that they have very

<sup>52</sup> *Ibid.*, p. 207.

<sup>53</sup> *Ibid.*, p. 231.

good reasons for not doing so, as they overthrow the very foundations of their physics), and try to save absolute space by relating it to God. Leibniz, therefore, reminds us of his already formulated objections, which he repeats in the pious hope that, finally, he will succeed in convincing his opponent (or, at least, the Princess of Wales) how utterly impossible it is to confer an absolute existence on void space.

I objected, that Space, taken for something real and absolute without Bodies, would be a thing eternal, impassible, and independent upon God. The Author endeavours to elude this Difficulty, by saying that Space is a property [attribute] of God.

I objected further, that if Space be a property [attribute], and *infinite Space* be the *Immensity of God*; *finite Space* will be the *Extension* or *Mensurability* of something finite. And therefore the *Space* taken up by a *Body*, will be the *Extension of that Body*. Which is an absurdity; since a *Body* can change *Space*, but cannot leave its *Extension*.<sup>54</sup>

Rather amusing to see Leibniz use against Clarke the same arguments that Henry More used against Descartes. But let us continue:

If infinite *Space* is God's *Immensity*, infinite *Time* will be God's *Eternity*; and therefore we must say, that what is in Space, is in God's Immensity, and consequently in his Essence; and that what is in Time, is also in the Essence of God. *Strange Expressions*; which plainly show, that the Author makes a wrong use of Terms.<sup>55</sup>

Assuredly, at least if we follow the traditional scholastic conceptions. But the Newtonians, as we know, reinterpret these terms and expressly identify God's immensity with infinite extension and God's eternity with infinite duration. They will therefore acknowledge that everything is

<sup>54</sup> "Mr. Leibniz's fifth paper," *ibid.*, p. 189.

<sup>55</sup> *Ibid.*, p. 193.

in God, without being obliged to put everything in His *essence*. But Leibniz insists:

I shall give another Instance of This. God's Immensity makes him actually present in all Spaces. But now if God is *in* Space, how can it be said that Space is *in* God, or that it is a Property [attribute] of God? We have often heard, that a Property [attribute] is in its Subject; but we never heard, that a Subject is in its Property [attribute]. In Like manner, God exists *in* all Time. How then can Time be *in* God; and how can it be a Property [attribute] of God? These are perpetual *Alloglossies*.<sup>56</sup>

Once more, the Newtonians would object that the preposition *in* is obviously taken in two different meanings, and that nobody has ever interpreted the attribute being *in* the substance as a spatial relation; that, moreover, they only draw a correct conclusion from God's omnipresence, which everybody admits, and God's simplicity, which everybody admits also, by refusing to recognize, in God, a separation between His substance and His power and asserting therefore His substantial presence everywhere. They would deny Leibniz's contention that

It appears that the Author confounds Immensity or the *Extension of Things*, with the *Space* according to which that Extension is taken. Infinite Space, is not the Immensity of God; Finite Space, is not the Extension of Bodies: As Time is not their Duration. Things keep their Extension; but they do not always keep their Space. Every Thing has its own Extension, its own Duration; but it has not its own Time, and does not keep its own Space.<sup>57</sup>

Of course not. But for the Newtonians, it means precisely that time and space do not belong to things, nor are relations based upon the existence of things, but belong to God as a framework in which things and events

<sup>56</sup> *Ibid.*, p. 195.

<sup>57</sup> *Ibid.*

have and take place. Leibniz knows it, of course, but he cannot admit this conception:

*Space* is not the Place of all Things; for it is not the Place of God. Otherwise there would be a thing co-eternal with God, and independent upon him; nay, he himself would depend upon *it*, if he has need of *Place*.

If the reality of Space and Time, is necessary to the Immensity and Eternity of God, if God must be in Space; if being in Space is a Property [attribute] of God; he will, in some measure, depend upon Time and Space, and stand in need of them. For I have already prevented That Subterfuge, that Space and Time are *Properties* [attributes] of God.<sup>58</sup>

Still, Leibniz knows that his own position implies difficulties (they are not proper to it, but are those of the whole scholastic tradition): if space and time are only innerworldly entities, and did not exist before Creation, must we not assume that the creation of the world brought about change in God; and that, before it, He was neither immense nor omnipresent? is not, therefore, God, in His own conception, dependent upon creatures? Leibniz writes then:

'Tis true, the Immensity and Eternity of God would subsist, though there were no Creatures; but those Attributes would have no dependence either on *Times* or *Places*. If there were no Creatures, there would be neither *Time* nor *Place*, and consequently no actual *Space*. The Immensity of God is independent upon *Space*, as Eternity is independent upon *Time*. These attributes signify only, that God would be present and co-existent with all the Things that should exist.<sup>59</sup>

A perfect answer. . . . Alas, the Newtonian will not accept it, and will persist in his affirmation that though,

<sup>58</sup> "Mr. Leibniz's fifth paper," *ibid.*, p. 235.

<sup>59</sup> *Ibid.*, p. 259.



of course, God cannot be co-present with things that do not exist, their existence or non-existence does not make Him more, or less, present in those places where these things, once created, will co-exist with Him.

Having dealt with the general problem of space and time, Leibniz passes to the re-examination of the particular problem of attraction. Dr. Clarke's explanation did not satisfy him; quite the contrary. A miracle is not defined by its being an exceptional and rare happening: a miracle is defined by the very nature of the event. Something that cannot be explained *naturally*, that is, something that cannot result from the interplay of *natural* forces, that is, forces derived from the nature of things, is and remains a miracle. Now the nature of things does not admit action at a distance. Attraction therefore would be a miracle, though a perpetual one. Moreover, according to Leibniz, the suggestion made by Dr. Clarke to explain it by the action of non-mechanical, "spiritual" forces, is even worse; this, indeed, would mean going back behind Descartes, renouncing science for magic. Once more we see expressed in this debate the radical opposition of two conflicting views of nature, and of science: Leibniz can accept neither the Newtonian conception of the insufficiency of the material nature nor the provisional positivism of his conception of "mathematical philosophy":

I objected, that an *Attraction*, properly so called, or in the *Scholastic* Sense, would be an Operation at a Distance, without any *Means* intervening. The Author answers here, that an *attraction* without any *means* intervening would be indeed a Contradiction. Very well! But then what does he mean, when he will have the Sun to attract the Globe of the Earth through an empty Space? It is God himself that performs it? But this would be a *Miracle*, if ever there was any. This would surely exceed the Powers of Creatures.

Or, are perhaps some immaterial Substances, or

some spiritual Rays, or some Accident without a Substance, or some Kind of *Species Intentionalis*, or some other *I know not what*, the Means by which this is pretended to be performed? Of which sort of things, the Author seems to have still a good stock in his Head, without explaining himself sufficiently?

*That Means* of communication (says he) is invisible, intangible, not Mechanical. He might as well have added, inexplicable, unintelligible, precarious, groundless, and unexampled.

If the Means, which causes an *Attraction* properly so called, be constant, and at the same time inexplicable by the Powers of Creatures, and yet be true; it must be a perpetual *Miracle*: And if it is not miraculous, it is false. 'Tis a Chimerical Thing, a Scholastic *occult quality*.

The Case would be the same, as in a Body going round without receding in the Tangent, though nothing that can be explained, hindered it from receding. Which is an Instance I have already alleged; and the Author has not thought fit to answer it, because it shows too clearly the difference between what is truly *Natural* on the one side, and a *chimerical occult Quality* of the Schools on the other.<sup>60</sup>

Once more Dr. Clarke replied. He was, needless to say, not convinced. Leibniz's subtle distinctions did not succeed in hiding the brute fact that his God was subjected to a strict and unescapable determinism. He lacked not only the true freedom that belongs to a spiritual being but even the spontaneity (Leibniz, moreover, seemed to Clarke to confound the two) belonging to an animal one: He was no more than a pure mechanism enchained by an absolute necessity. If Dr. Clarke had the gift of foreseeing things, he would say: a mere calculating machine!

Leibniz's renewed attack on Newton's conceptions of time, space and motion is not more successful.

It is affirmed, that Motion necessarily implies a *Relative Change of Situation in one Body, with re-*

<sup>60</sup> "Mr. Leibniz's fifth paper," *ibid.*, pp. 269 ff.

gard to other Bodies; And yet no way is shown to avoid this absurd Consequence, that then the *Mobility* of one Body depends on the *Existence* of other Bodies; and that any single Body existing Alone, would be *incapable* of Motion; or that the Parts of a circulating Body (suppose the Sun) would lose the *vis centrifuga* arising from their circular Motion, if all the extrinsic Matter around them was annihilated, 'tis affirmed that the *Infinity of Matter* is an Effect of the *Will of God*.<sup>61</sup>

And yet, if it were true that—as taught by Descartes—a finite universe is contradictory, is it not clear that, in this case, God neither is, nor was, able to limit the quantity of matter and therefore did not create, and cannot destroy it? Indeed,

if the *Material Universe* CAN possibly, by the Will of God, be *finite* and *Moveable*: (which this learned Author here finds himself necessitated to *grant*, though he perpetually treats it as an *impossible* supposition;) then *Space* (in which That Motion is performed) is manifestly *independent* upon *Matter*. But if, on the contrary, the *material Universe* Cannot be *finite* and *moveable* and *Space* cannot be *independent* upon *Matter*; then (I say) it follows evidently, that God neither Can nor ever Could set Bounds to Matter; and consequently the *material Universe* must be not only *boundless*, but *eternal* also, both a *parte ante* and a *parte post* necessarily and *independent of the Will of God*.<sup>62</sup>

As for the relation between space, body and God, Clarke restates his position with perfect clarity:

The space occupied by a body is not the extension of that body; but the extended body exists in this space.

There is no bounded space; but our imagination considers in the space, which has no limits and can-

<sup>61</sup> "Dr. Clarke's fifth reply," *ibid.*, p. 295.

<sup>62</sup> *Ibid.*, p. 313.

not have any, such a part, or such a quantity that it judges convenient to consider.

Space is not the affection of one or several bodies, nor that of any bounded thing, and it does not pass from one subject to another, but it is always, and without variation, the immensity of an immense being, which never ceases to be the same.

Bounded spaces are not properties of bounded substances; they are only parts of the infinite space in which the bounded substances exist.

If matter were infinite, infinite space would no more be a property of this infinite body than finite spaces are properties of finite bodies. But, in this case, infinite matter would be in infinite space as finite bodies are in it now.

*Immensity*, as well as *Eternity*, is essential to God. The *Parts of Immensity* (being totally of a different Kind from *corporeal*, *partable*, *separable*, *divisible*, *moveable* Parts, which are the ground of *Corruptibility*), do no more hinder *Immensity* from being essentially *One*, than the *Parts of Duration* hinder *Eternity* from being essentially *One*.

God himself is not subjected to any change by the diversity and the change of things that are in him, and which in him have life, motion and being.

This *strange* Doctrine is the express Assertion of *St. Paul*, as well as the plain Voice of *Nature and Reason*.

God is not in space or in time; but his existence is the cause of space and time. And when we say, in conformity with the language of the vulgar, that God exists in all the spaces and in all the times,

These Words mean only that he is *Omnipresent* and *Eternal*, that is, that *Boundless Space* and *Time* are necessary *Consequences* of his Existence; and not, that Space and Time are Beings distinct from him, and in which he exists.<sup>63</sup>

Moreover,

to say that *Immensity* does not signify *Boundless Space*, and that *Eternity* does not signify *Duration* or

<sup>63</sup> "Dr. Clarke's fifth reply," *ibid.*, pp. 301 ff.

*Time without Beginning and End*, is (I think) affirming that *Words* have no *meaning*.<sup>64</sup>

As for the criticism of attraction, Clarke, of course, maintains his point of view: miracles are rare and meaningful events produced by God for definite reasons; a perpetual miracle is a contradiction in terms; and if not, then the *pre-established Harmony* of Leibniz is a much greater one. Moreover—Clarke is rather astonished that Leibniz does not understand this—in Newtonian science or *mathematical* philosophy, attraction (whatever be its ultimate physical or metaphysical explanation) appears only as a phenomenon, as a general fact and as a mathematical expression. Therefore,

it is very unreasonable to call *Attraction* a *Miracle* and an unphilosophical Term; after it has been so often distinctly declared, that by That Term we do not mean to express the Cause of Bodies tending *towards each other*, but barely the *Effect*, or the *Phaenomenon it self*, and the *Laws or Proportions of that Tendency*, discovered by *Experience*

which clearly shows

that the Sun *attracts* the Earth, through the intermediate void Space; that is that the Earth and Sun *gravitate* towards each other, or *tend* (whatever be the Cause of that Tendency) towards each other, with a Force, which is in a direct *proportion* of their *Masses*, or *Magnitudes and Densities together*, and in an inverse duplicate proportion of their *Distances*.<sup>65</sup>

But, of course, there is much more behind this Leibnizian opposition to attraction than a mere unwillingness to adopt the point of view of “mathematical” philosophy with its admission into the body of science of incomprehensible and inexplicable “facts” imposed upon us by empiricism: what Leibniz really aims at is the self-

<sup>64</sup> *Ibid.*, p. 349.

<sup>65</sup> *Ibid.*, p. 367.

sufficiency of the world-mechanism, and there is very little doubt that the law of conservation of the *vis viva* achieves it in a still better way than the Cartesian law of conservation of motion.

The Newtonian world—a clock running down—requires a constant renewal by God of its energetic endowment; the Leibnizian one, by its very perfection, rules out any intervention of God into its perpetual motion. Thus it is not surprising that for Dr. Clarke the fight for void space, hard atoms and absolute motion becomes a fight for God's Lordship and presence, and that he asks Leibniz why

. . . so great Concern should be shown, to exclude God's *actual* Government of the World, and to allow his Providence to *act* no further than barely in *concurring* (as the Phrase is) to let *all Things* do only what they would do *of themselves of mere Mechanism*.<sup>68</sup>

Why, indeed? Leibniz, who was much more interested in morals than in physics and in man than in the cosmos, could have answered that it was the only means to avoid making God responsible for the actual management, or mismanagement, of this our world. God just did not do what He wanted, or would like to do. There were laws, and rules, that He could neither change nor tamper with. Things had natures that He could not modify. He had made a perfect mechanism in the working of which He could not interfere. Could not and should not, as this world was the best of all the possible worlds that He could create. God, therefore, was blameless for the evils that He could not prevent or amend. After all, this world was only the best *possible* world, not a perfectly good one; that was *not possible*.

Leibniz might have said this in reply to Clarke. But he did not read Clarke's *fifth* reply. He died before he re-

<sup>68</sup> "Dr. Clarke's fifth reply," *ibid.*, p. 335.

ceived it. Thus their fight, a fight in which both sides fought *pro majore Dei gloria*, ended as abruptly as it started. The outcome of the Homeric struggle was not conclusive; neither side, as we have seen, budged an inch. Yet, in the decades that followed, Newtonian science and Newtonian philosophy gained more and more ground, gradually overcoming the resistance of the Cartesians and the Leibnizians who, though opposing each other on many points, made a common front against the common foe.

At the end of the century Newton's victory was complete. The Newtonian God reigned supreme in the infinite void of absolute space in which the force of universal attraction linked together the atomically structured bodies of the immense universe and made them move around in accordance with strict mathematical laws.

Yet it can be argued that this victory was a Pyrrhic one, and that the price paid for it was disastrously high. Thus, for instance, the force of attraction which, for Newton, was a proof of the insufficiency of pure mechanism, a demonstration of the existence of higher, non-mechanical powers, the manifestation of God's presence and action in the world, ceased to play this role, and became a purely natural force, a property of matter, that enriched mechanism instead of supplanting it. As Dr. Cheyne explained quite reasonably, attraction was assuredly not an essential property of body, but why should not God have endowed matter with unessential properties? Or, as Henry More and Roger Cotes—and later, Voltaire—pointed out, since we possess no knowledge of the substances of things, and know nothing about the link that connects property with substance, even in the cases of hardness or impenetrability, we cannot deny that attraction belongs to matter just because we do not understand how it works.

As for the dimensions of the material universe which Newtonians at first had opposed to the actual infinity of absolute space, the relentless pressure of the principles of plenitude and sufficient reason, by which Leibniz managed to infect his successful rivals, made it co-extensive

with space itself. God, even the Newtonian one, could obviously not limit His creative action and treat a certain part of infinite homogeneous space—though able to distinguish it from the rest—in a way so utterly different from the others. Thus the material universe, in spite of filling only an exceedingly small part of the infinite void, became just as infinite as this. The same reasoning which prevented God from limiting His creative action in respect to space could, just as well, be applied to time. An infinite, immutable and *sempiternal* God could not be conceived as behaving in a different manner at different times, and as limiting His creative action to a small stretch of it. Moreover, an infinite universe existing only for a limited duration seems illogical. Thus the created world became infinite both in Space and in Time. But an infinite and eternal world, as Clarke had so strongly objected to Leibniz, can hardly admit creation. It does not need it; it exists by virtue of this very infinity.

Furthermore, the gradual dissolution of traditional ontology under the impact of the new philosophy undermined the validity of the inference from the attribute to its supporting substance. Space, consequently, lost progressively its attributive or substantial character; from the ultimate stuff which the world was made of (the substantial space of Descartes) or the attribute of God, the frame of His presence and action (the space of Newton), it became more and more the void of the atomists, neither substance nor accident, the infinite, uncreated nothingness, the frame of the absence of all being; consequently also of God's.

Last but not least, the world-clock made by the Divine Artifex was much better than Newton had thought it to be. Every progress of Newtonian science brought new proofs for Leibniz's contention: the moving force of the universe, its *vis viva*, did not decrease; the world-clock needed neither rewinding, nor mending.

The Divine Artifex had therefore less and less to do in the world. He did not even need to conserve it, as the



world, more and more, became able to dispense with this service.

Thus the mighty, energetic God of Newton who actually "ran" the universe according to His free will and decision, became, in quick succession, a conservative power, an *intelligentia supra-mundana*, a "Dieu fainéant."

Laplace who, a hundred years after Newton, brought the New Cosmology to its final perfection, told Napoleon, who asked him about the role of God in his *System of the World*: "Sire, je n'ai pas eu besoin de cette hypothèse." But it was not Laplace's *System*, it was the world described in it that no longer needed the hypothesis God.

The infinite Universe of the New Cosmology, infinite in Duration as well as in Extension, in which eternal matter in accordance with eternal and necessary laws moves endlessly and aimlessly in eternal space, inherited all the ontological attributes of Divinity. Yet only those—all the others the departed God took away with Him.



## PLENITUDE AND SUFFICIENT REASON IN LEIBNIZ AND SPINOZA

ARTHUR O. LOVEJOY

Among the great philosophic systems of the seventeenth century, it is in that of Leibniz that the conception of the Chain of Being is most conspicuous, most determinative, and most pervasive. The essential characteristics of the universe are for him plenitude, continuity, and linear gradation. The chain consists of the totality of monads, ranging in hierarchical sequence from God to the lowest grade of sentient life, no two alike, but each differing from those just below and just above it in the scale by the least possible difference. Since the metaphysics of Leibniz is a form of idealism, or, more precisely, of panpsychism, the gradation is defined primarily in psychological rather than morphological terms; it is by the levels of consciousness which severally characterize them, the degrees of adequacy and clarity with which they "mirror" or "represent" the rest of the universe, that the monads are differentiated. Nevertheless, the material world also, as a *phenomenon bene fundatum*, the mode in which these incorporeal entities necessarily manifest themselves to one another, has a derivative and somewhat equivocal, but essential, place in Leibniz's scheme of things; and he habitually employs

Reprinted by permission of the publishers from Arthur O. Lovejoy, *The Great Chain of Being* (Chapter V), Cambridge, Mass., Harvard University Press, Copyright, 1936, 1964, by the President and Fellows of Harvard College.

without hesitation the ordinary language of physical realism, and discusses the problems of physical science as genuine, not as fictitious, problems. And in the material world too the same three laws hold good; and they should be used by the investigator of nature as guiding principles in his empirical researches. The best expression of this is in a letter of Leibniz's, usually omitted in the editions of his collected writings, to the special importance of which several recent students of his philosophy have drawn attention.<sup>1</sup> He writes:

All the different classes of beings which taken together make up the universe are, in the ideas of God who knows distinctly their essential gradations, only so many ordinates of a single curve so closely united that it would be impossible to place others between any two of them, since that would imply disorder and imperfection. Thus men are linked with the animals, these with the plants and these with the fossils, which in turn merge with those bodies which our senses and our imagination represent to us as absolutely inanimate. And, since the law of continuity requires that when the essential attributes of one being approximate those of another all the properties of the one must likewise gradually approximate those of the other, it is necessary that all the orders of natural beings form but a single chain, in which the various classes, like so many rings, are so closely linked one to another that it is impossible for the senses or the imagination to determine precisely the point at which one ends and the next begins—all the species which,

<sup>1</sup> This was published in 1753 by Koenig in the course of the celebrated controversy with Maupertuis in which Voltaire took the most conspicuous part. The authenticity of the letter was denied by Maupertuis and by the Berlin Academy, of which he was President, but its genuineness is sufficiently established by both external and internal evidence, and is not questioned by contemporary Leibniz specialists. The letter was quoted at length by Flourens in his *Analyse raisonnée des travaux de Cuvier*, 1841. The text may be found in Buchenau and Cassirer's *Leibniz: Hauptschriften zur Grundlegung der Philosophie*, II, 556-59.

so to say, lie near to or upon the borderlands being equivocal, and endowed with characters which might equally well be assigned to either of the neighboring species. Thus there is nothing monstrous in the existence of zoophytes, or plant-animals, as Budaeus calls them; on the contrary, it is wholly in keeping with the order of nature that they should exist. And so great is the force of the principle of continuity, to my thinking, that not only should I not be surprised to hear that such beings had been discovered—creatures which in some of their properties, such as nutrition or reproduction, might pass equally well for animals or for plants, and which thus overturn the current laws based upon the supposition of a perfect and absolute separation of the different orders of coexistent beings which fill the universe;—not only, I say, should I not be surprised to hear that they had been discovered, but, in fact, I am convinced that there must be such creatures, and that natural history will perhaps some day become acquainted with them, when it has further studied that infinity of living things whose small size conceals them from ordinary observation and which are hidden in the bowels of the earth and the depths of the sea.<sup>2</sup>

These, however, are familiar aspects of Leibniz's system. We shall in this lecture be concerned with a more special and somewhat more difficult group of inter-connected questions, about which some differences of interpretation have arisen among those who have studied his doctrine. These questions are: first, the relation of the principle of plenitude to that fundamental theorem in his philosophy which he calls the principle of sufficient reason; second, the scope which he consequently gives to the principle of plenitude; and third—a question involved in both the others—whether he really escapes that absolute logical de-

<sup>2</sup> For the derivation of the principle of continuity from that of plenitude, cf. *Principes de la nature et de la grâce* (1718), 3: "Tout est plein dans la nature, . . . et à cause de la plénitude du monde, tout est lié."

terminism which is characteristic of the philosophy of Spinoza.

In his formulations of the principle of sufficient reason Leibniz is less precise and consistent than a philosopher ought to be, when he is dealing with a proposition to which he ascribes such immense importance in natural science and in metaphysics. Sometimes it seems to include, if not to reduce to, the ordinary scientific postulate of causal uniformity in nature. More frequently it is expressed in terms which seem to relate to final rather than efficient causation; and it has commonly been construed as an extreme assertion of a teleological view of nature—as equivalent to the thesis that the existence and properties and behavior of things are to be explained ultimately by the values which they serve to realize, and that we can discover factual truths of science by tracing out the implications of the fundamental scheme of values which the universe expresses. Thus Russell in his volume on Leibniz writes that “the law of sufficient reason, applied to actual existents, reduces itself to the assertion of final causes.” Hence, in order to infer actual existence, whether from another existent, or from mere notions, the notion of the “good must always be employed”—a doctrine which, as Russell adds, confers upon the concept “good” a relation to real existence such as no other concept possesses.<sup>3</sup> While such a summary of Leibniz’s meaning can be supported by fairly numerous citations from his text, it nevertheless fails to express his more fundamental and characteristic view on the matter, and tends to give an inverted conception of the relations in his philosophy of the notions of “good” and “existence.” The motive which can be shown to have begotten his faith in the principle of sufficient reason, as a cosmological generalization, was not chiefly a desire to find what is commonly meant by teleology in nature—that is, neat adjustments to such ends as the comfort, convenience, happiness, or edification of man or other con-

<sup>3</sup> *Philosophy of Leibniz*, 34.

scious beings. Leibniz was less concerned (I do not say he was not at all concerned) to maintain that the reason for a thing is a "good," in the common sense of conduciveness to the subjective satisfaction of God or man or animal, than to maintain that the thing at all events has *some* reason, that it is *logically* grounded in something else which is logically ultimate.

For it still seemed to Leibniz, as to others of his time, highly important, and not necessarily impossible, to know whether or not the existence of any world at all and the general constitution of the world that actually exists are anything more than colossal accidents; whether the universe might just as conceivably never have been, or have been of quite another sort, but simply happened by some lucky or unlucky chance to find itself real and possessing the characters it has. To all appearance reality is full, not only in its minor details but also in its more general features, of mere idiosyncrasies, for which no sort of explanation can be given. This is especially evident when we consider the purely numerical and quantitative attributes of the universe. One number in the arithmetical series is no more sacred nor more obviously suited to existence than another. Is it nevertheless true that, out of all the possible numbers of, say, prime-atoms, or planets, or suns, or germcells, or minds, some one number, a wholly arbitrary selection, rose fortuitously into actual being? Or again, are what we call the laws of nature themselves mere whimsies of matter, which (for a time at least) happens unaccountably to behave with apparent regularity in one manner, out of a million others that were, logically considered, equally open to it? There was, of course, a familiar element in the philosophic heritage of Leibniz and his age which at once intensified this difficulty and determined the special form in which it presented itself. Most non-materialistic philosophers of the seventeenth and eighteenth centuries still habitually thought in terms of two realms of being. The world of essences, "natures," or Platonic Ideas, was to them as indubitably and objectively

there to be reckoned with as the world of individual, temporal existents, physical or spiritual. The former, indeed, though it did not "exist," was the more fundamental and the more solid reality of the two.<sup>4</sup> It is true that conceptualism rather than strict Platonic realism was the commonly accepted doctrine about the status of the Ideas; Leibniz himself, for example, held that the realm of essences would have no being at all, if it were not eternally contemplated by the mind of God. "Every reality must be based upon something existent; if there were no God there would be no objects of geometry."<sup>5</sup> Yet this did not, of course, mean that, for the mind of man, the essences were any the less independent and substantial; and even in the mind of God every essence (including his own) had, by the prevalent though not universal opinion, a certain logical priority over the existent or existents corresponding to it. And in this eternal order alone was the necessity which is identical with complete rationality to be found; it was the locus of all ultimate reasons, the region in which the only finally satisfying explanations of facts were to be sought. An "explanation" which simply referred one opaque fact to another—even though the latter were an event or existent prior in time, or one of those generalized facts which we call empirical laws—never touched bottom;<sup>6</sup> and

<sup>4</sup> For a typical expression of this, cf. Fénelon, *De l'existence de Dieu* (1718): "Mes idées sont supérieures à mon esprit, puisqu'elles le redressent et le corrigent. Elles ont le caractère de la Divinité, car elles sont universelles et immuables, comme Dieu. . . . Si ce qui est changeant, passager et emprunté existe véritablement, à plus forte raison ce qui ne peut changer et qui est nécessaire." (Pt. II, ch. iv).

<sup>5</sup> The conception of the essences of things as contained in the mind of God goes back at least to Philo, and had been imposed upon most medieval thought by the influence of Augustine; hence the transition from the Platonic to the modern sense of the term "idea." Cf. Webb, *Studies in the History of Natural Theology*, 247.

<sup>6</sup> So Leibniz speaks of *ille transitus ab uno contingente ad aliud contingens prius aut simplicius qui exitum habere non potest (ut etiam revera unum contingens non est causa alterius, etsi*



to assert that this was, not merely the situation in which our limited understanding frequently finds itself, but also the situation of the objective world, was, it seemed, to proclaim the fundamental fortuitousness of everything. If, on the other hand, the existence of an entity, or its properties and behavior, could be seen to be rooted in "the natures of things"—i.e., to be implied in the very constitution of some essence or in the immutable system of relations which obtains between essences<sup>7</sup>—a further quest for reasons became not only superfluous but impossible. The bare fact had been traced back to a necessity, and was no longer opaque to the understanding; a seeming accident of contingent existence had been apprehended under its eternal aspect—that is, as consequent upon some "eternal truth" inherent in the Ideas, the opposite to which would be a logical absurdity. In the typical phraseology of an eighteenth-century writer: "When it appears that an absolute necessity in the nature of things themselves," as, for example, in geometrical figures, "is the reason and ground of their being what they are, we must necessarily stop at this ground and reason; and to ask what is the rea-

---

*nobis videatur*): *Opuscules et fragments*, ed. Couturat (1903), 19. Cf. also *Philos. Schriften*, ed. Gerhardt, VII, 303 ff. "The reasons of the world lie in something extramundane, different from the chain of states or series of things, of which the aggregate constitutes the world. We must therefore pass from physical or hypothetical necessity, which determines posterior states of the world by prior, to something which is of absolute or metaphysical necessity, the reason for which cannot be given."

<sup>7</sup> I have put the conception in these two alternative ways because there is much wavering in Leibniz and his contemporaries on the question whether necessary judgments are ultimately "analytic" or "synthetic." Usually Leibniz himself called them analytic; but he certainly did not mean by this that they were mere tautologies. Such a judgment, as he somewhere says, is not a *coccysmus inutilis*. It does not fall within the purpose of the present historical study to discuss the fundamental logical questions involved in this distinction. For further comment upon it, see the writer's "Kant's Antithesis of Dogmatism and Criticism," *Mind*, N. S., 1906.

son of this reason which is in the nature of things the last of all reasons, is absurd.”<sup>8</sup>

To a philosophy which thus had constantly before it two planes of reality, in only one of which the reason-seeking intellect of man could come to rest, the need for somehow and somewhere finding in the realm of Ideas not merely necessary connections between attributes which might or might not “exist,” but a determining ground of concrete existence itself, was naturally acute. Unless the fact of existence could at some point be exhibited as a necessity subsisting in the world of essences, the two worlds remained strangely unrelated; there was no bridge from one to the other; and the whole realm of the existent appeared given over to blank unreason. Such was the issue in seventeenth- and eighteenth-century philosophy to which Leibniz’s principle of sufficient reason was one of several answers. And that principle was, we shall find, essentially a development and elaboration of the theme sounded in the *Timaeus*. Leibniz himself, in a letter of 1715, described his own philosophy as in part an attempt to systematize Platonism:

I have, ever since my youth, been greatly satisfied with the ethics of Plato, and also, in a way, with his metaphysics; these two, moreover, go together, like mathematics and physics. If someone should reduce Plato to a system, he would render a great service to the human race; and it will be seen that I have made some slight approximation to this.<sup>9</sup>

We shall, however, better understand the meaning and historical significance of Leibniz’s answer to the question if we recall the nature of the others which were current in his time. That there must be a sufficient reason why *something* exists rather than nothing—i.e., that somewhere existence is explicable as a necessity arising out of the logical system of essences—was accepted as axiomatic by many

<sup>8</sup> J. Jackson, *The Existence and Unity of God* (1734), 39.

<sup>9</sup> *Philos. Schriften*, ed. Gerhardt, III, 637.

who rejected the principle formulated by Leibniz. Thus Samuel Clarke, who during the first three decades of the eighteenth century passed for the foremost of living English philosophers, declared that it is "an express contradiction" to suppose that "of two equally possible things, *viz.* whether *anything* or *nothing* should from eternity have existed, the one is determined, rather than the other, absolutely by nothing." Whatever exists, in short, must have some "cause"; and since "to have been produced by some external cause cannot possibly be true of everything," there must be somewhere a being which "exists by an absolute necessity originally in the nature of the thing itself." And this necessity or internal reason for being

must be antecedent; not, indeed, in time, to the existence of the being itself, because that is Eternal; but it must be antecedent in the natural order of our ideas, to our supposition of its being; that is, this necessity must not barely be *consequent* upon our supposition of the existence of such a being, . . . but it must antecedently force itself upon us, whether we will or no, even when we are endeavoring to suppose that no such being exists. . . . (For) a necessity . . . absolutely such in its own nature, is nothing else but its being a plain impossibility, or implying a contradiction, to suppose the contrary.<sup>10</sup>

The being whose nature or essence is thus the necessitating—and therefore, for our thought, the explanatory—ground of its existence, is, of course, God: "if any one asks, what sort of Idea the Idea of that being is, the supposition of whose non-existence is thus an express contradiction, I answer: 'Tis the first and simplest idea we can possibly frame, or rather which (unless we forbear thinking at all) we cannot possibly extirpate or remove out of

<sup>10</sup> Clarke's *Demonstration*, etc. (1706), 22–26. Eight editions of this work, usually with Clarke's Boyle Lectures of 1705 added, were published by 1717. For further expressions of the same argument, see J. Clarke, *Defence*, etc. (1722), Jackson, *op. cit.*

our minds, of *a most Simple Being, absolutely Eternal and Infinite, Original and Independent.*" If there were not in this case a reason determining existence, all sorts of absurdities would be possible; the First Cause would be as likely to be finite as infinite; it might "as possibly in other places without any reason not exist, as it does without any reason, exist, in those places where the phenomena of nature prove that it does exist."<sup>11</sup> Nay, worse; as a disciple of Clarke's argued, unless there is in God's essence a sufficient reason for his existence, we have no rational assurance that he may not some day lapse into nonentity.

It is plain and certain that any alteration of existence of a being may as possibly be affected without a cause or reason, as the existence of that being can either be supposed to be originally determined without any cause or reason, or to continue to exist without any cause or reason. If therefore the first cause existed originally without any cause or reason, it may be mutable or corruptible in its nature, and so may carry within itself the cause, ground, or reason of its ceasing to be.<sup>12</sup>

These were theological ways of saying that the position of a universe in which existence was at no point grounded in necessity would be in the last degree precarious—such a position as Victor Hugo long afterwards described with a more adequate rhetoric: "*La fin toujours imminente, aucune transition entre être et ne plus être, la rentrée au creuset, le glissement possible à toute minute, c'est ce précipice-là qui est la création.*"

In the case of one being, then, Clarke, and a numerous company of other philosophers and theologians of the time, were as averse as Spinoza or Leibniz from admitting that existence has no determining reason. God's existence, at all events, could not be supposed to be an accident. It is true that many of those who affirmed this—and Clarke

<sup>11</sup> S. Clarke, *op. cit.*, 27.

<sup>12</sup> J. Jackson, *op. cit.* (1734), 31.

among them—at the same time raised somewhat quibbling demurrers to Anselm's ontological argument, which involved the same dialectic; yet there were, apparently, only a small minority<sup>13</sup> who were prepared to deny that there is an *ens necessarium*, i. e., an entity of which the essence is such that it would not be what, *quâ* essence, it is, if it did not also exist.

But was it sufficient to recognize only one such instance, and to leave all the rest of the world of existents with no point of support in the World of Ideas—or, what was the theological expression for the same conception, in the divine reason? To this question the philosophy of Spinoza (like that of Abelard and of Bruno before him) had given an emphatic answer in the negative. Every fact of existence must be held to have its roots in the eternal order, in the necessities belonging to essences and their relations; and every essence, likewise, must have its flowering among existents. That the necessary actualization of all possibles is affirmed by Spinoza also has not been evident to all of his expositors. With some logical implications of his system, and with a few of his express statements, it seems to conflict. To suppose him to have accepted the principle of plenitude would, it has been suggested, entail the contradiction that all successive entities and events must exist simultaneously. For the necessity of their existence would be a logical necessity; and to it therefore time would be irrelevant. We do not—or the mathematicians of Spinoza's time did not—say merely that, given a plane triangle, it is necessary that its interior angles should some day *become* equal to two right angles. As little could one who maintained that the universe by logical necessity contains all

<sup>13</sup> Among those who expressly took this extreme position were E. Law (in King, *Origin of Evil*, 1732 ed., I, 52-56) and Thomas Knowles, *The Existence and Attributes of God* (1746). Yet even such opponents of the "*a priori* theology" were unable to avoid occasional admissions of the proposition they elsewhere denied; e. g., Knowles (*op. cit.*, 48-49). It is to be noted that Law treats all the reasoning about God's necessary existence as "built upon the principle of sufficient reason" (*op. cit.*, 77).

things capable of existence admit that some individual things come into being after others. But individual things do come into existence one after another; and we ought not to impute to Spinoza without clear warrant a doctrine inconsistent with this truism. Again, he sometimes definitely says that we may have "ideas of non-existent modes" i. e., of particular objects which have no being apart from the conceiving intellect.<sup>14</sup> Furthermore, he declares that "no definition involves or expresses any particular multitude or definite number of individuals"; e. g., the definition of a triangle tells us only the "nature" of a triangle and implies nothing as to the number of triangles that exist. Hence it is argued that the actual particulars which at any time make up the universe are for Spinoza a non-necessary, and therefore arbitrary, selection from among the far more numerous things which might have been. But this way of interpreting him is, I think, quite impossible. The principle of sufficient reason, as he lays it down, applies to non-existence as well as to existence: "of everything whatsoever a cause or reason must be assigned, alike for its existence or its non-existence."<sup>15</sup> And it is "the intellect of God, in so far as it is conceived to constitute the divine essence," that "is in reality the cause of all things."<sup>16</sup> Could there be any reason lying in the nature of this fundamental cause why some things that are capable of existence should not exist? Manifestly not; there is nothing that can be conceived, i. e., nothing that is not self-contradictory, which does not "fall under an infinite intellect." Since, then, God can conceive of all essences, since neither he nor the universe would be rational if existence arbitrarily accrued to some finite essences while others lacked it, since "whatever we conceive to be in the power of God necessarily exists,"<sup>17</sup> and since this power is un-

<sup>14</sup> *Ethics*, I, Prop. 8.

<sup>15</sup> *Ibid.*, I, Prop. 11.

<sup>16</sup> *Ibid.*, I, Prop. 17, Scholium.

<sup>17</sup> *Ibid.*, I, Prop. 35.

limited (except by the impossibility of conceiving or producing the self-contradictory), it follows that "from the necessity of the divine nature must follow an infinite number of things in infinite ways—that is, *all* things which can fall within the sphere of an infinite intellect."<sup>18</sup> Indeed, Spinoza in some passages infers the necessary existence of all possible finite modes of each attribute directly from the principle of sufficient reason, without recourse to the argument from the existence of God as cause—his existence being itself, in fact, deduced from the same principle. While the essence "triangle," taken separately, does not of itself imply the existence of any triangles, their existence *does* follow "from the order of the material universe as a whole (*ex ordine universae naturae corporeae*); for from this it must follow either that a triangle necessarily exists, or else that it is impossible that it should now exist. This is self-evident. From which it follows that a thing necessarily exists if no cause or reason can be given which prevents its existence." In other words, the class "triangles" is one possible species of material bodies (with respect to shape), one mode of "extension"; and both the species, and any individual of the species, will have actual existence, unless there is a "reason" which renders this impossible; and such a reason would consist solely in the fact that its existence in some manner involved self-contradiction. Similarly, God's necessary existence can be proved simply from the fact that "no cause or reason can be given which prevents him from existing, or which rules out his existence." For it would be "absurd to affirm of an absolutely infinite and supremely perfect being" that his existence involves contradiction.<sup>19</sup> There are thus in Spinoza two distinct arguments for the existence of God. The first is the ontological argument, simply from the definition of *causa sui* as that "whose essence involves existence"; and this argument is applicable solely to God, since there can

<sup>18</sup> *Ibid.*, I, Prop. 16; cf. Tschirnhausen's comment on this proposition, Spinoza's *Opera* (1895), II, 428.

<sup>19</sup> *Ibid.*, I, Prop. 11.

(it is assumed) be only one such essence. The other is the argument from the necessity of the existence of *anything* whose existence is not precluded by some logical impossibility; and that is applicable to all essences, though the essence "God" has with respect to it one unique advantage, inasmuch as (Spinoza assumes) it is evident that an essence defined as having the properties of "absolute infinity" and "perfection" cannot be debarred from existence by any intrinsic or extrinsic logical impediment. And to these two proofs correspond the two ways of deducing the principle of plenitude: the first indirectly, through the conception of God whose existence is already independently proved by the ontological argument, the second directly, from the same premise by which, in the second proof, God's own existence is established.

It has, however, been suggested by at least one learned commentator that Spinoza affirms the principle of plenitude only in the sense that all conceivable things either have existed or will hereafter exist. But this interpretation not only conflicts with the truism that the logically necessary is no more so at one time than another, but is also expressly repudiated by Spinoza, both in the *Short Treatise* and the *Ethics*. Those, he declares, are in error who contend that, "if God *had* created everything that is in his intellect," so that there would now be nothing more left for him to create, he could not now be said to be omnipotent. On the contrary, we must, Spinoza says, conceive "that God's omnipotence has been displayed from all eternity and will for all eternity remain in the same state of activity."<sup>20</sup> It would be an absurdity to imagine that at some former time he created a world different from that which he now creates; for this would imply that his intellect and will were then different from what they now are. If his creation had at one time been incomplete or imperfect, *he* would have been at some time incomplete or imperfect—which would be a contradiction in terms. In short,

<sup>20</sup> *Ethics*, I, Prop. 17, Scholium.



there can at no time be any "cause whereby he could be moved to create one thing rather or more than another." Thus "from the supreme power of God, or from his infinite nature, an infinity of things in an infinity of modes—that is, all things—have necessarily flowed forth, or always follow by the same necessity, just as from the nature of a triangle it follows from all eternity and to all eternity that the sum of its three angles is equal to two right angles."<sup>21</sup> The existence of all possible beings at all times is therefore an implicate of the divine nature.

Our principle of plenitude—in what may be called its static form—is thus inherent in the very substance of Spinoza's doctrine. From the timeless immutability of the World-Ground he argues directly to the necessary "fullness" and also the necessary invariability of the temporal world's contents. But the paradox of that principle is more apparent in his philosophy than in others; and it is, in part, this fact which has led certain expositors to the misinterpretation to which I have referred. From the eternal logical necessity belonging to an essence there is, in truth, *no* valid argument to any conclusion about existence in time. For time itself is alien to that necessity; it is an alogical character of nature. Whatever is true of an essence is true of it all at once; but what is true of the temporal world is not true of it all at once. Becoming and change, as such, simply do not fit into an eternal rational order. The attempt to pass over from that order to one in which some things have their being at one time, and quite other things at a later time, is a *non-sequitur*, and worse; but this was required by the principle of plenitude—was most clearly of all so required when that principle was regarded as an implicate of the principle of sufficient reason. If a literal realization of all genuine possibles is essential to a reasonable world, everything and everybody should have existed, and every event should have occurred, from all eternity,

<sup>21</sup> *Ibid.* The dialectic of the principle of plenitude, in its most rigorous sense, is still more fully developed in the *Short Treatise*, I, chaps. 2 (14–16), 6.

in a *totum simul*; but nature is not a *totum simul*. What makes this paradox more apparent in Spinoza is the fact that the notion of species plays, as a rule, no such part in his system as it does in many others equally committed to the same principle. As frequently interpreted, the "fullness" of the universe was sufficiently realized if every *kind* of being was always exemplified in the temporal order; species, not individuals, were the units for which Nature cared. But Spinoza usually leaps at once from the divine attributes or the "infinite modes" to individuals existing at one time and not at others, and in differing numbers at different times. That, in this sense, nature is *not* constant, nor constantly "full," was evident; and Spinoza therefore, while asserting the principle of plenitude, was driven into inevitable and glaring inconsistencies in his application of it. An increasing realization of this difficulty we shall find giving rise in writers of the following century to a radical reinterpretation of the principle.

Spinoza had thus expressed the principle of plenitude in its most uncompromising form and had represented it as necessary in the strict logical sense. Everything shared in the same completely sufficient reason for being that the existence of God was by most philosophers conceived to possess. But Spinoza (unlike Bruno) had not made a great deal of the aspect of the principle of plenitude which was to be most fruitful of consequences in the eighteenth century; what most interested him in his own doctrine was not the consideration that everything that logically can be must and will be, but the consideration that everything that is must, by the eternal logical nature of things, have been, and have been precisely as it is. It was this consequence of his dialectic, the sense of the utter inevitability (amounting to the ultimate inconceivability of the opposite) of every characteristic and every vicissitude of human life, that was most congenial to his own moral temper and seemed to him most fitted to free men from the torment of the passions. This universalization of necessity rendered teleological ways of thinking about things inadmissible;

since nothing could conceivably have been otherwise, nothing could be said to manifest purpose or preference, a choice of good where evil, or a lesser good, might have been genuinely possible; hence these very distinctions lost their meaning.

The alternative view, that there is only one point at which a reason for existence can be found in the realm of essence, was represented by a great body of philosophical and theological opinion, both before and after Spinoza. According to this view, while there is, indeed, an *ens necessarium*, the being which necessarily exists is itself a pure Will, a power to choose independently not only of external causes but also of rational motives. To make the divine will subject even to the constraint of reason would be to deny its freedom and its sovereignty over all lesser things. Hence the existence of God involved no necessity that the world of finite beings should exist. The more extreme and consistent form of this doctrine declared that not even a general tendency to create *something*, to share the privilege of existence with other beings, could be held to belong to the essence of deity. This thesis had, indeed, a double historic root. It was primarily a manifestation of that apotheosis of irresponsible will which constituted one side, though only one side, of the orthodox theology of Christendom. It could also be deduced from one of those two conflicting Platonic conceptions of God which were the heritage of what is called Christian theology. If the essence of deity was the same as the Idea of the Good, if the differentiating attribute of the Absolute Reality was self-sufficiency, God, even though he *did* create a world, could have no reason for doing so. Nothing in his essential nature made it necessary or desirable for him to bring a universe of imperfect beings into existence. The creative act must therefore be conceived to be entirely groundless and arbitrary in itself, and therefore in its inclusions and exclusions. As Duns Scotus, or a follower of his, declared, "every creature has a merely accidental relation to the goodness of God, since from them [the creatures] nothing

is added to his goodness, any more than the addition of point to a line lengthens the line."<sup>22</sup>

Thus from medieval as well as Greek philosophy it had come down as an axiom that nothing could be more contradictory of the very notion of deity than to admit that anything in the existence of such a being is dependent upon, or in any degree affected for better or worse by, the existence or action of any being conceived as distinct from it. Perhaps the most extraordinary triumph of self-contradiction, among many such triumphs in the history of human thought, was the fusion of this conception of a self-absorbed and self-contained Perfection—of that Eternal Introvert who is the God of Aristotle—at once with the Jewish conception of a temporal Creator and busy interposing Power making for righteousness through the hurly-burly of history, and with primitive Christianity's conception of a God whose essence is forthgoing love and who shares in all the griefs of his creatures.<sup>23</sup> When applied to the notion of creation—which is the aspect of this syncretism which here concerns us—the doctrine of the self-sufficiency of deity implied, as we have already seen, that from the divine—that is, from the final and absolute—point of view a created world is a *groundless* superfluity. The existence of creatures, as Augustine had said, "is a good which could in no way profit God"; and therefore, he had added, the question why God chose to create is a self-contradictory as well as impious one, since it seeks for a cause for that primary act of sheer will which is the cause of all other things<sup>24</sup>—except certain other acts of sheer

<sup>22</sup> *De rerum principio*, q. 4; cf. also *Opus Oxoniense*, I, d. 1, q. 2, n. 10. So Cusanus wrote that if you add the creation to God, you have added nothing, *Creatura non habet etiam entitatis sicut accidens, sed est penitus nihil* (*De doct. ignor.*, I).

<sup>23</sup> The fusion was, of course, made easier by the presence in Platonism, from the outset, of the last as well as the first of these conceptions.

<sup>24</sup> *De civ. Dei*, XII, 14–17; iv; *De Genesi contra Manichaeos*, I, 2. With the paradoxes of this doctrine Augustine in the former

will permitted certain of the creatures. For Augustine, and a long line of successors, the Platonic-Aristotelian conception of the self-sufficiency of deity thus became an essential safeguard against the doctrine of universal necessity. If the world-generating act had been determined by any motive, had had any ground even in the divine essence, it would not have been free; but since any action of a being already self-sufficing must be absolutely unmotivated, its freedom could not be doubted. The connection of the two ideas was summed up by Augustine in a neat sorites which played a great part in European thought for many centuries: *ubi nulla indigentia, nulla necessitas; ubi nullus defectus, nulla indigentia; nullus autem defectus in Deo; ergo nullus necessitas*.<sup>25</sup>

Two potent elements in the philosophical tradition, then—the Platonic and Aristotelian apotheosis of self-sufficiency and the Augustinian insistence upon the primacy of will in the constitution of reality—both alike could be construed as implying that the being which necessarily exists, though it has in fact generated other beings, did so by an essentially motiveless, unaccountable, and therefore accidental—and, indeed, incongruous—exercise of its freedom. Upon this theorem the changes are rung interminably by seventeenth- and eighteenth-century philosophers and divines. Descartes is especially insistent upon it: God must have been *tout-à-fait indifférent à créer les choses qu'il a créées*.

For if some reason, or some appearance of good, had preceded his preordination of things, it would without doubt have determined him to create what was best; but, on the contrary, because he determined to make the things that are actually in the world, for this reason they are, as it is written in Genesis, 'very

---

passage struggles painfully, ending in an amazing tangle of formal contradictions.

<sup>25</sup> *De diversis quaestionibus* LXXXIII, 22.

good'; that is, the reason of their goodness depends upon the fact that he willed to make them.<sup>26</sup>

For Descartes this dependence of things upon the Absolute Will extended, not merely to their existence, but to their essences or "natures." There is nothing in the essence "triangle" which makes it intrinsically necessary that the sum of the interior angles of such a figure should be equal to two right angles, nothing in the nature of number which requires that two and two should make four. What to us appear as "eternal truths" are in reality "determined solely by the will of God, who, as sovereign legislator, has ordained and established them from all eternity."<sup>27</sup>

So far, at least, as existence is concerned this same consequence is deduced from the Platonic premise in the chief classic of orthodox Anglican divinity. Bishop Pearson's *Exposition of the Creed* (1659) declares that

God is in respect of all external actions absolutely free without the least necessity. . . . Those creatures which are endued with understanding, and consequently with a will, may not only be necessitated in their actions by a greater power, *but also as necessarily be determined by the proposal of an infinite good*; whereas *neither* of these necessities can be acknowledged in God's actions, without supposing a power beside and above Omnipotency, or a real happiness beside and above All-Sufficiency. Indeed, if God were a necessary agent in the works of creation, the creatures would be of as necessary being as he is; whereas the necessity of being is the undoubted prerogative of the First Cause.<sup>28</sup>

<sup>26</sup> *Rép. aux sixièmes objections*, par. 12. For another example of the same conjunction of ideas, cf. Malebranche, *Entretiens*, VI, 5: "La volonté de créer des corps n'est point nécessairement renfermée dans la notion de l'être infiniment parfait, de l'être qui suffit pleinement à lui-même. Bien loin de cela, cette notion semble exclure de Dieu une telle volonté."

<sup>27</sup> Descartes, *loc. cit.*

<sup>28</sup> *Op. cit.*, 1659 ed., 110; italics mine.

This was equivalent to saying that the only way of escape from such a philosophy as Spinoza's—then still to be published—lay in holding that God had no reason in his creative activity and could not possibly derive any satisfaction from it.

The expressions of this theme in philosophic or religious poetry sometimes sound like echoes of classical passages setting forth the Epicurean conception of the "careless gods"; when Ronsard, for example, hymns the "goddess Eternity" in a strange mixture of pagan and Christian imagery, one is reminded as much of Lucretius as of Aristotle.

La première des Dieux, où bien loin de souci  
Et de l'humain travail qui nous tourmente ici,  
Par toi-même contente et par toi bienheureuse,  
Tu règnes immortelle en tout bien plantureuse.<sup>29</sup>

But when Drummond of Hawthornden rewrote Ronsard's hymn in English and converted it into a finer and more consistent piece of Christian Platonism, he retained this passage, but elaborated it and gave it further point, by bringing the notion of self-sufficiency into conjunction with that of creation:

No joy, no, nor perfection to Thee came  
By the contriving of this world's great frame;  
Ere sun, moon, stars, began their restless race,  
Ere paint'd with purple clouds was Heaven's round face,  
Ere air had clouds, ere clouds wept down their showers,  
Ere Sea embracèd Earth, ere Earth bore flowers,  
Thou happy lived; World nought to Thee supplied.  
All in Thy self Thy self Thou satisfied.<sup>30</sup>

<sup>29</sup> *Hymne de l'Eternité: Oeuvres*, ed. Marty-Laveaux (1891), IV, 159-63. For the reference to the "goddess Eternity" Ronsard had good theological authority; cf. Nicolaus Cusanus, *De ludo globi*, I: "Aeternitas Mundi creatrix Deus est."

<sup>30</sup> *An Hymne to the Fairest Faire: Poetical Works*, ed. Kastner, II, 40; spelling modernized. The passage may have been also partly inspired by the similar lines in Du Bartas's *Première Semaine*; cf. Sylvester tr. (1598), 3.

The question, disapproved by Augustine, to which such a conception nevertheless perennially gave rise,<sup>31</sup> was pointedly expressed by a late seventeenth-century Platonist, John Norris: since God is

. . . In himself compendiously blest, . . .

. . . Is one unmov'd self-center'd Point of Rest,  
Why, then, if full of bliss that ne'er could cloy,  
Would he do ought but still enjoy?  
Why not indulge his self-sufficing state,  
Live to Himself at large, calm and secure,  
A wise eternal Epicure?  
Why six days work, to frame  
A monument of praise and fame  
To him whose bliss is still the same?

What need the wealthy coin, or he that's blest, create?<sup>32</sup>

Milton in this matter, as in others, is an interesting example of a mind beset by cross-currents; but in the main it was towards the assertion of the arbitrariness of the deity's action that the poet-theologian tended. He rejects at times the extreme nominalistic doctrine of Descartes; the essences of things, and the truths concerning the intrinsic relations of essences, are logically prior to any will, so that not even God could alter them; thus he declared in the *Treatise of Christian Doctrine* that "a certain immutable and internal necessity of acting right, independently of all extraneous influence whatever, may exist in God conjointly with the most perfect liberty, both which principles in the divine nature tend to the same point." Yet this, Milton evidently felt, inclined too much to deter-

<sup>31</sup> Dante, for example, could not refrain from seeking an explanation of this mystery from Beatrice; the answer, though in accord with tradition, was scarcely illuminating, nor very well in accord with itself:

Non per avere a sè di bene acquisto,  
ch'esser non può, ma perchè suo splendore  
potesse, risplendendo, dir 'Subsisto.' (Par. XXIX, 13-15.)

<sup>32</sup> John Norris, *A Divine Hymn on the Creation* (1706).



minism; for a little later he asserted virtually the opposite: it cannot be "admitted that the actions of God are themselves necessary, but only that he has a necessary existence, for Scripture itself testifies that his decrees and therefore his actions, of what kind soever they be, are perfectly free."<sup>33</sup> And the consideration of the divine self-sufficiency leads Milton to give especial emphasis to the motivelessness of the deity's exercise of his creative power. God is not inherently "good," in the theological sense in which goodness consists in the actual conferring of existence upon other beings. His "goodness was free to act or not."<sup>34</sup> "Questionless," we are told in the *Christian Doctrine*,

it was in God's power consistently with the perfection of his own essence not to have begotten the Son, inasmuch as generation does not pertain to the essence of Deity, who stands in no need of propagation;<sup>35</sup>

—an observation repeated in *Paradise Lost*:

No need that Thou  
Shouldst propagate, already infinite,  
And through all numbers absolute, though One.

The implication of this, that there appeared to be in the nature of things not only no reason why any world of imperfect creatures should exist, but every reason why it should not exist, Adam almost makes explicit, when briefly expounding some points of theology to his Maker:

Thou in Thyself art perfect and in Thee  
Is no deficiency found; . . .  
Thou in Thy secrecy although alone,  
Best with Thyself accompanied, seek'st not  
Social communication.<sup>36</sup>

<sup>33</sup> *Tr. of Chr. Doctr.*, Sumner's tr., ch. III, 35.

<sup>34</sup> *Paradise Lost*, VII, 171-72.

<sup>35</sup> *Tr. of Chr. Doctr.*, ch. V, 85. To the Arian Milton the Son was only the greatest of created beings.

<sup>36</sup> *P. L.*, VIII, 415 f., 427 ff.; cf. IV, 417-19.

Though this may seem a somewhat odd thing for Adam to say under the circumstances, it proves to have, in the poem, some dramatic motivation; for this proleptic quotation from Aristotle<sup>37</sup> serves the human interlocutor as a polite opening for a reminder that he is not himself self-sufficient, and therefore needs a companion in Eden. But what is clearest about the passage is that Milton the theologian saw in this juncture of his narrative an opportunity to affirm once again that a self-absorbed and unproductive God would be not less, but, if possible, more divine, and that there is no necessity and, indeed, no reason for the existence of any creature. Milton's zeal for this thesis is the more curious because his theology here seems out of harmony with his ethical creed and moral temper.<sup>38</sup>

<sup>37</sup> The passage may be described as a summary of the chapter of the Eudemean Ethics already cited in Lecture II (VI, 12).

<sup>38</sup> Yet it is in the thought of the divine self-sufficiency—with some weakening of its meaning and a happily confused logic—that Milton finds religious comfort, and the theme for some famous though in part rather feeble lines, in the sonnet "When I consider how my light is spent." It is because "God doth not need either man's work or his own gifts" that all service is equal, and "they also serve who only stand and wait." The notion of self-sufficiency, which properly implied the complete impassibility and indifference of deity, naturally tended to be transformed into the essentially different but religiously much more satisfying notion of the disinterestedness of the divine activity. Thus (1) Henry More argues that, since God could not conceivably be benefited by anything that man is, does, or suffers, he must be supposed to aim only at man's good; this, of course, tended to destroy the conception, still potent in popular religion, of the jealous celestial autocrat, insistent upon subservience and compliments from his creatures.

All what he doth is for the creature's gain,

Nought seeking from us for his own content:

What is a drop unto the Ocean's main? (*Psychathanasia*, III, iv, 22.)

This made for a sort of ethical utilitarianism upon theological grounds. The same argument occurs in Bruno's *Spaccio*, II. (2) For the same reason another Platonist, Norris of Bemerton, points out that religious exercises are for man's benefit, not to afford any gratification to the object of worship. (*A Collection*

As recent writers have pointed out, he was no Puritan rigorist, but in many respects a typical mind of the humanistic Renaissance, delighting in the splendor and diversity of the sensible world; and the excellence of man did *not* for him consist in the imitation of God in respect of the most distinctive of the divine attributes. It is not by an attempt to approximate or to become absorbed into the divine sufficiency through ascetic self-discipline, the cultivation of a *contemptus mundi*, or a withdrawal from those

Relations dear and all the charities  
Of father, son, and brother,

that man attains his good. "Propagation," indeed, was the first of duties imposed upon man by a deity himself represented as only tardily, unessentially, and (relatively to his possibilities) meagrely propagative:

Our Maker bids increase, who bids abstain  
But our Destroyer, foe to God and man?  
. . . . . Man by number is to manifest  
His single imperfection, and beget  
Like of his like, his image multiplied,  
In unity defective, which requires  
Collateral love and dearest amity.<sup>39</sup>

---

of *Miscellanies*, 211.) (3) Henry More finds a curious argument for immortality in the idea of a self-sufficient God. If the eternal spectator of human life could be supposed to derive any satisfaction from beholding that moving scene, there would be (to use the phrase of a philosopher of our own time) a certain conservation of the values of each life, and the extinction of the individual would not be an absolute loss.

"But alas! What doth the perpetual repetition of the same life or deiform-image throughout all ages add unto him that is at once infinitely himself, viz: good and happy? So that there is nothing considerable in the creation, if the rational creature be mortal. For neither is God at all profited by it, nor man considerably." (*Complete Poems*, ed. Grosart, 165.)

It should be borne in mind that More and Norris (with some inconsistency) denied that the creation was arbitrary, while asserting it to be motiveless.

<sup>39</sup> P. L., IV, 748-49; VIII, 422-26.

There were thus in the thought of Milton some significant and instructive internal strains, characteristic not only of the man but of the historic juncture in which he lived. But our present concern is only with one element in this complex of mutually counter-working ideas.

A generation later Fénelon was with equal zeal elaborating upon the same ancient theme—now with Spinoza definitely in mind as the chief representative of the error to be attacked. No doubt, the Archbishop of Cambrai grants, it may be said to be “plus parfait à un être d’être fécond que de ne l’être pas”; but it does not follow that the divine perfection requires “an actual production.” The possession of a power is sufficient without the exercise of it—a strange proposition, but one to which Fénelon was driven as the only escape from Spinoza’s argument that an omnipotent being must also of necessity be omnificent. This theological paradox was apparently rendered more plausible to Fénelon by the undeniable truth that, though the gift of speech presumably makes human beings “more perfect,” their perfection is not necessarily proportional to their use of that faculty: “il arrive même souvent que je sois plus parfait de me taire que de parler.” There is, then, nothing on the side of the divine essence which necessitates the generation of everything, or even of anything: “nothing is more false than to say that God was obliged by that order which is himself to produce all that he could that is most perfect.” As little can it be said that there is anything on the side of the finite essences which could constitute a reason for their being:

If God considers the essences of things, he finds therein no determination to existence; he finds only that they are not impossible to his power. . . . Thus it is in his positive will that he finds their existence; for as to their essence, it contains in itself no reason or cause of existing; on the contrary, it necessarily contains in itself non-existence.<sup>40</sup>

<sup>40</sup> *Tr. de l'existence de Dieu*, II, v.

Any other view than this would make "the creature essential to the Creator," an indispensable part or aspect of his being. He would "produce eternally and of necessity," and so would have no freedom—and no long ante-mundane sabbath; and the *ens perfectissimum* would be, not a God above the world in his eternal and absolute self-sufficiency, but the total collection of finite beings conceived as the expression of this fundamental generative necessity.<sup>41</sup>

These reasonings of *a priori* theology were doubtless somewhat elusive to many minds even in the seventeenth and the early eighteenth century; but the same conclusion could be defended on more empirical grounds. It could be argued that—whether or not there be any inherent disposition to create in the divine essence—at all events the actual scope and specific contents of the created world give evidence of the arbitrariness of the choice of its Author. Samuel Clarke, for example, develops at some length the contention that the universe is full of facts which cannot be reconciled with Spinoza's doctrine—i. e., which are not "necessary" in the sense required.

All things in the world appear plainly to be the most arbitrary that can be imagined. . . . Motion itself, and all its quantities and directions, with the laws of gravitation, are entirely arbitrary, and might possibly have been altogether different from what they are now. The number and motion of the heavenly bodies have no manner of necessity in the nature of the things themselves. . . . Everything upon the Earth is still more evidently arbitrary, and plainly the product, not of necessity but will. What absolute necessity for just such a number of species of animals or plants?<sup>42</sup>

<sup>41</sup> *Ibid.*, cf. King, *Origin of Evil*, 1732 ed., 295: "If God was moved by the goodness of things to create the world, he would be a necessary agent."

<sup>42</sup> Clarke, *Demonstration*, etc. (1706), 7th ed., 65 ff. Clarke, it is true, speaks of a "necessity of fitness," which means that "things could not have been otherwise than they are without diminishing the beauty, order, and well-being of the whole—

In such a doctrine, obviously, the principle of plenitude had no proper place (though sometimes, as by Archbishop King, the two were inconsistently combined). That principle ostensibly gave certain important *a priori* knowledge about the constitution of the world of existents, though it was supposed to be also capable of empirical confirmation. But the anti-rationalistic theology which insisted upon the arbitrariness of the divine decrees had affinities rather with scientific empiricism. Since such matters as the number of species, the continuity or discontinuity of the differences between them, the quantity and original distribution of matter, the existence or non-existence of vacua, are purely arbitrary, the facts respecting them must be ascertained through experience or remain unknown.

It was therefore natural that the philosophic poets who dwelt with predilection upon the divine absoluteness and freedom from even rational constraint should reject the principle of plenitude and its implications. Drummond of Hawthornden, for example, is at pains to declare explicitly that there is an infinite number of Ideas which never are actualized, since God does not so choose; in the *Hymn to the Fairest Fair* Truth is pictured as standing before the throne of Heaven holding a mirror

Where shineth all that was,  
That is, or shall be; here, ere ought was wrought,  
Thou knew all that Thy pow'r with Time forth-brought,  
And more, things numberless that Thou couldst make,  
That actually shall never being take.

Milton likewise seems to have been as antipathetic to the principle of plenitude as to that of sufficient reason, and makes no use of it for his theodicy, either in *Paradise Lost* or in the *Treatise of Christian Doctrine*. The notion of a hierarchical scale of nature is, indeed, not lacking,

---

which would have been impossible, since it is impossible for a wise being to resolve to act foolishly." Clarke here seems to approximate Leibniz's position, but in the later controversy between them he is a long way from it.

and the law of continuity is clearly expressed. All things are composed of

One first matter all,  
Indu'd with various forms, various degrees  
Of substance, and in things that live, of life;  
But more refin'd, more spiritous, and pure,  
As nearer to him plac'd, or nearer tending,  
Each in their several active spheres assign'd,  
Till body up to spirit work in bounds  
Proportion'd to each kind. . . .<sup>43</sup>  
. . . . Flowers and their fruit,  
Man's nourishment, by gradual scale sublimed,  
To vital spirits aspire, to animal,  
To intellectual, give both life and sense,  
Fancy and understanding, whence the soul  
Reason receives.<sup>44</sup>

There are passages in which the poet dilates upon the magnitude and variety of the sensible world; and in the prose treatise he repeats without qualification the pregnant scholastic maxim that "entity is good, non-entity not good."<sup>45</sup> But the general view which he adopted forbade him to suppose that all possible forms necessarily exist or even tend to exist. On the contrary, the original act of creation was not merely belated but also extremely restricted. How little the dialectic of the idea of plenitude determined Milton's scheme of things is most clearly shown by his adoption of the doctrine of Jerome and of Origen—which Thomas Aquinas and Dante had expressly rejected<sup>46</sup>—according to which the creation was at first confined to "heavenly essences," spiritual or ethereal na-

<sup>43</sup> P. L., V, 472-79.

<sup>44</sup> P. L., V, 482-87.

<sup>45</sup> *Tr. of Chr. Doctr.*, 184.

<sup>46</sup> *Summa Theol.*, I, q. 61, a.3; *Paradiso*, 29, 37. Of course Milton could hardly have made an epic out of a theodicy if he had not adopted this theory; there would have been no stirring tale of the wars in heaven to relate. But it is difficult to believe that John Milton framed his theological creed to suit the exigencies of his literary ambitions.

tures. It was only after the disappointing behavior of many of this highest order of possible creatures that the Supreme Being (whose self-sufficiency here seems quite completely forgotten), by second intention, bethought himself of the possibility of "repairing that detriment" by the creation of "another world," including the earth and man and its other inhabitants—in other words, by calling into being a certain number of possibles of a lower order.<sup>47</sup>

In the next generation the principle of plenitude was more explicitly assailed in stodgy verse by Blackmore in his *Creation* (1712):

Might not other animals arise  
Of diff'rent figure and of diff'rent size?  
In the wide womb of possibility  
Lie many things which ne'er may actual be:  
And more productions of a various kind  
Will cause no contradiction in the mind. . . .  
These shifting scenes, these quick rotations show  
Things from necessity could never flow,  
But must to mind and choice precarious beings owe.<sup>48</sup>

It is, then, chiefly in its connection with these preoccupations of Leibniz's predecessors and contemporaries, and with their conflicting doctrines concerning the relation of the world of finite existents to the logical order of essences constituting the primary object of the divine intellect, that his principle of sufficient reason is historically to be understood. The principle was, first of all, an affirmation of the fundamental proposition common to Spinoza and to most of those who in nearly all other respects were in complete disagreement with that philosopher—the proposition that there is at least one being whose essence necessarily and directly implies existence. The ontological argument, in short, is for Leibniz a part of the law of

<sup>47</sup> We have, however, noted elsewhere some slight trace of the influence of the principle of plenitude upon Milton, when he is dealing with certain questions of cosmography.

<sup>48</sup> *Creation*, Bk. V; the lines appear to be a versification of a passage of S. Clarke's, cited in part above.



sufficient reason—a fact well recognized in the eighteenth century. It is because that law is valid that we are entitled to ask, as the first question in metaphysics (in distinction from physical science): “Why does something exist rather than nothing? For ‘nothing’ is simpler and easier than something.”

Now this sufficient reason of the existence of the universe cannot be found in the series of contingent truths. . . . The sufficient reason which has no need of any other reason must be outside the sequence of contingent things, and must be a necessary being, else we should not have a sufficient reason with which we could stop.<sup>49</sup>

Here, then, the “sufficient reason” is nothing less than a logical necessity believed to be inherent in an essence; it is specifically in this sense that Leibniz speaks of God as the *ultima ratio rerum*.

But the principle further means for Leibniz that the existence of all *finite* things must likewise in some man-

<sup>49</sup> *Principes de la nature et de la grâce* (1714), §§7–8; in *Philos. Schriften*, VI, 599–602; the same connection of ideas in Wolff (1731). At this point, it will be seen, the principle of sufficient reason and Leibniz’s other “great principle,” that of contradiction, come to the same result. A necessary being must exist because there would otherwise be no *sufficient* reason for anything; but also, a necessary being must exist because its essence involves existence, so that to conceive of it as non-existent would be self-contradictory; and again, unless the opposite were thus self-contradictory, it would not meet the requirements of a sufficient reason. The second proposition is simply the ontological argument. Some writers on Leibniz have made too much of his criticism of that argument. He accepts it absolutely, but adds that, as usually stated, it omits a needful logical precaution. The “possibility” of the idea of God—i. e., its non-contradictoriness, should be shown before the necessity of existence is, through the principle of contradiction, inferred from it. Leibniz, however, had in fact no doubts about the “possibility” of the idea of God; so that the distinction does not affect his conclusions in any way, and remains only a logical refinement upon the Anselmic reasoning. Cf. *Philos. Schriften*, IV, 294, 296, 359, 424.

ner be grounded in the rational order of Ideas and their implications—in the world of possibles which, as it was commonly phrased, God had present to him “before the creation.” Here Leibniz is still at one with Spinoza, who, he observes, was entirely right in opposing those philosophers who “declared that God is indifferent and that he decrees things by an absolute act of will.”<sup>50</sup> If there were so much as a single fact in nature which had its cause in a fiat not wholly determined by rational grounds, the world would *eo ipso* be an affair of “blind chance.”<sup>51</sup> And chance becomes no more satisfactory to the philosopher as a category for describing the ultimate constitution of reality by being piously called God. The supposition, exemplified in so many of Leibniz’s contemporaries, that the number of existents in general, or of the members of any given class of them—of atoms, or of monads, or (what was the purely theological form of the same difficulty) of the elect—constitutes a small selection from among the possibles, is not, to Leibniz, rendered less obnoxious by the supposition of a Selector, if his foible for that particular numeral is assumed to be itself fortuitous, a reasonless eccentricity of Omnipotence.

If the will of God did not have for a rule the principle of the best, it would either tend towards evil, which would be worst of all; or else it would be in some fashion indifferent to good and evil and guided by chance. But a will which always allowed itself to act by chance would scarcely be of more value for the government of the universe than a fortuitous concurrence of atoms, with no God at all. And even if God should abandon himself to chance only in some cases and some respects, . . . he would be imperfect, as would the object of his choice; he would not deserve to be wholly trusted; he would act without reason in those cases, and the government of the universe

<sup>50</sup> *Réf. inédite*, etc. (1854), 50.

<sup>51</sup> *Philos. Schriften*, VII, 390.

would be like certain games, half a matter of chance, half of reason.<sup>52</sup>

In all this Leibniz was continuing the tradition of Platonistic rationalism in theology which during the previous half-century had been best represented by the Cambridge Platonists, to whose doctrine his own is also in many other points very similar. Henry More, for example, had written in 1647:

If God do all things simply at his pleasure,  
Because he will, and not because it's good,  
So that his actions will have no set measure,  
Is 't possible it should be understood  
What he intends? . . .  
Nor of well-being, nor of subsistency  
Of our poor souls when they do hence depart,  
Can any be assur'd, if liberty  
We give to such odd thoughts, that thus pervert  
The laws of God, and rashly do assert  
That will rules God, but Good rules not God's will.<sup>53</sup>

Why anyone should think it an enhancement of the dignity of either God or man to act, or even to be capable of acting, without a determining reason, is to Leibniz, as it was to his Platonistic precursors, wholly incomprehensible; "it is a paradox to represent as a perfection the least reasonable thing in all the world, of which the advantage would consist in being privileged against reason." Such a character as Clarke and King had ascribed to the First Cause might perhaps be attributed by a poet to "some imaginary Don Juan," or, conceivably, some "*homme romanesque*" might affect the appearance of it and even persuade himself that he actually possesses it; but there never will be found in nature any choice to which one is not brought by an antecedent representation of good and bad, by inclinations or by reasons."<sup>54</sup> The freedom of

<sup>52</sup> *Théodicée*, in *Philos. Schriften*, VI, 386.

<sup>53</sup> *Philosophical Poems*, ed. Grosart, 1878; *Psychathanasia*, Bk. III, Canto 4, stanzas 19-21, p. 85.

<sup>54</sup> *Philos. Schriften*, VI, 401.

indifference, in short, "is impossible, but if there were such a thing, it would be harmful."

If we leave for a moment the question of the meaning of this aspect of the principle of sufficient reason for Leibniz, and consider the grounds of his faith in it, they appear, as in the passage last cited, to be chiefly two. Partly, he presents it as a sort of axiomatic proposition in psychology: just as all physical events must have efficient causes, so all conscious choices must have motivating reasons; and these reasons must lie in the apparent values inherent in the objects chosen. This proposition, then, is for Leibniz an "eternal truth"; "a power of determining oneself without any cause, or any source of determination, implies contradiction. . . . It is metaphysically necessary that there be some such cause."<sup>55</sup> But at bottom Leibniz, like More, adopts the principle, it is evident, for reasons which may, in one sense of a highly ambiguous term, be called pragmatic. The conception of the world we live in which would follow from the rejection of the principle was intolerable to such a mind as his. It meant placing Caprice on the throne of the universe—under however venerable a title. It implied that Nature, having no determining reason in it, flouts and baffles the reason that is in man. A world where chance-happening had so much as a foothold would have no stability or trustworthiness; uncertainty would infect the whole; anything (except, perhaps, the self-contradictory) might exist and anything might happen, and no one thing would be in itself even more probable than any other. Such a hypothesis was not one which Leibniz could entertain if any alternative was available; and the principle of sufficient reason would un-

<sup>55</sup> *Philos. Schriften*, II, 420. As such a psychological generalization, Leibniz in substance points out, the principle of sufficient reason is equivalent to the proposition "accepted by everybody except some doctors too much wrapped up in their own subtleties," and approved by the greatest of the Schoolmen, that all volition is *sub specie boni*, a choice of what either is, or is by the chooser believed to be, a good. (*Philos. Schriften*, VI, 412-13.)

questionably have seemed to him a practically indispensable postulate if he had not believed it to be a logically necessary truth.<sup>56</sup>

There was, however, it may be noted in passing, one rather awkward consequence of the proposition that God can do nothing without a reason. This difficulty Samuel Clarke effectively pressed home in his controversy with Leibniz. The celebrated ass of Buridan, being, by hypothesis, a perfectly rational ass, was unable to choose between two equally large and equally appetizing bales of hay equidistant from his nose; having no sufficient reason for preferring one to the other, the sagacious animal starved to death in the midst of plenty. Clarke pointed out, in substance, that Leibniz attributed to his Maker precisely such an irrational excess of rationality. There presumably confront even omnipotence, Clarke suggested, some situations in which it is desirable to choose one or the other of two alternatives, though there is no reason why one should be chosen rather than the other. In these situations, then, such a deity as Leibniz had set up would never be able to act at all. Leibniz was unable to deny that, if there are any such situations, this consequence must follow from his premises.

'Tis a thing indifferent to place three bodies, equal and perfectly alike, in any order whatsoever; and consequently they *never will be placed in any order* by Him who does nothing without wisdom.

<sup>56</sup> Leibniz on occasion puts the case even for the principle of contradiction on pragmatic grounds—for those who will accept none other. Reasoning with a correspondent who had evinced a leaning towards “the scepticism of the Academics,” he points out that that principle can be sufficiently justified on the ground of its needfulness if we are to reason at all. “Without assuming it we should be obliged to give up all hope of demonstrations. One ought not to demand the impossible; to do so would be to give evidence that one was not seriously seeking for truth. I, therefore, shall boldly assume (*supposerai*) that two contradictories cannot be true.” (*Philos. Schriften*, I, 382.)

But Leibniz adds that there cannot be, in any possible world, such a perfect balance of values between any two alternatives.<sup>57</sup> This assertion was manifestly difficult to prove and, on the face of it, highly improbable. Leibniz was involved in this embarrassment by that excessively simple and quasi-mechanical conception of volition, which, as we have seen, was one of the senses which the principle of sufficient reason had for him. Where there was no preponderance of value in one contemplated object rather than another, an intelligent agent would be as powerless to move as a piece of matter in an equilibrium of forces. But this was not the significant essence of the principle. Leibniz might with advantage have limited it to the proposition that where there *is* an actual difference between possibles, that which by its own nature has the greater reason for existing must necessarily be created by God.

Thus far Leibniz's argument seems to place him on the side of Spinoza, as against the critics of that philosopher. The primary being exists by a logical necessity; it is also necessary that all the things derivative from it should have "reasons" for existence lying in its nature and in their own; and this might seem to mean that all things follow *ex necessitate divinae naturae*, and that the existent universe is just such a system as Spinoza had represented—logically inevitable in its least detail, so that no alternative could ever have been so much as conceived by an infinite intellect. From this consequence, however, Leibniz professed to have found a way of escape. Temperamentally wishful, like many other philosophers, to eat his cake and have it too, he conceived that his position was as effectually differentiated from Spinoza's cosmic determinism as from the theory—whether in its theological or in its naturalistic or Epicurean form—of a chance-world; and the original and distinctive thing in his formulation of the principle of sufficient reason seemed to him to consist precisely in its

<sup>57</sup> *Philos. Schriften*, VII, 372.

indication of a third possible view opposed to both these extremes.

His attempted differentiation of his position from Spinoza's rested upon two points. (a) In Spinoza, the divine reason allowed the divine will no option, and, indeed, there was no distinction between them. Such a view seemed to Leibniz objectionable, partly for reasons similar to those indicated in passages already cited from other writers. He too, at least at times, desired a God who might be said to possess a will, and not merely an intellect consisting in an infinity of automatically self-realizing essences; and to him too Spinoza's metaphysics appeared to exclude the possibility of any moral philosophy. But he had also a special reason of his own for rejecting this feature of Spinozism—a reason which at the same time, as he thought, showed the solution of the difficulty. Spinoza had, Leibniz observes, failed to see that existence must be limited not only to the possible, in the logical sense, but also to the compossible; i. e., that any actual world must be made up of entities which, besides being consistent with themselves, are also compatible with one another. And although, in the world of essences, all simple, positive "natures" find a place without conflict, when the world of concrete existents is considered not all combinations are possible. Essences, therefore, conceived as materials for translation into existence, come in sets, each set excluding some essences, but including all that form one compossible group. When this is borne in mind, Leibniz argues, it becomes apparent that there not only may but must have been a selection, namely, of one of those sets, and thereby the exclusion of all that did not belong to it, before any world of concrete existents could arise at all; in theological terms, that the divine Reason before the creation was confronted with a multitude—in fact, as Leibniz tells us, with an infinite number—of models of worlds, any one, but only one, of which could conceivably be created. An act of choice is thus seen to be a logically necessary implicate of the very idea of an existent world. It seems to

follow that the principle of plenitude does not hold for Leibniz in the same absolute sense as for Spinoza: "the question *utrum detur vacuum formarum*, i. e., whether there are species which are possible but nevertheless do not exist" must be answered (subject to a large qualification presently to be noted) in the affirmative; "there necessarily are species which never have existed and never will exist, since they are not compatible with the series of creatures which God has chosen."<sup>58</sup>

In his discovery of this notion of compossibility Leibniz took great pride, but it has no definite meaning until we know what the criterion of compossibility is supposed to be; and about this he has little to say, and that little by no means clear. Once, at least, he admits that no statement of that criterion can be given:

It is not yet known to men from what the impossibility of different things arises or how it comes about that different essences are opposed to one another, since all purely positive terms appear to be compatible *inter se*.<sup>59</sup>

Some hints of an explanation, however, are elsewhere discoverable; and there is some, if not altogether conclusive, textual justification for Russell's suggestion that the criterion of compossibility for Leibniz lay in an assumed necessity that any possible world should be subject to uniform laws. If a world, for example, is to contain motion, then there must also be for it invariable laws of motion. In some possible world, the law of inverse squares will be one of these laws; and for that world, though not for other possible ones, any arrangement or movement of matter not in accordance with the Newtonian formula will be impossible. Thus, in Russell's phrase, "what is called the 'reign of law' is metaphysically necessary in Leibniz's philosophy."<sup>60</sup> Yet if this be Leibniz's meaning, he neither

<sup>58</sup> *Philos. Schriften*, V, 286.

<sup>59</sup> Cf. *Opuscles*, etc. (ed. Couturat, 1903), 522.

<sup>60</sup> Russell, *Philos. of Leibniz* (1901), 66; the interpretation is based chiefly upon *Philos. Schriften*, II, 51.



states it unequivocally nor gives it any detailed application or illustration. What, however, seems plain is that compossibility does not differ in principle from possibility, in the traditional philosophical sense of the latter term; it is merely a special case of it. No truths concerning compossibility are contingent, but all inhere in the logical natures of the essences concerned. In short, both the make-up of each world and the limitation of the possibility of actualization to *some* one of them were among the necessities subsisting eternally in the realm of Ideas, antecedently to the choice of a particular one among the worlds to be the recipient of the privilege of existence.

(b) Consequently, Leibniz's introduction of the notion of compossibility did *not* of itself, as he sometimes seems to have supposed, essentially differentiate his principle of sufficient reason from Spinoza's universal necessity. It was merely a refinement or elaboration upon the familiar conception of "possibility," which Spinoza could without inconsistency have accepted.<sup>61</sup> The original question remained, namely, whether anything, and if anything, what, necessitated the choice of the actually existent world from among the possibles. But here Leibniz propounded a further distinction by which he professed to escape decisively from the deadly reproach of Spinozism. In maintaining that the divine will must necessarily be determined by the most sufficient reason, and must therefore infallibly choose the one best out of the many possible worlds, he is not, he explains, asserting the "brutal, metaphysical necessity" of Spinoza, but a "moral necessity." For the opposite, i. e., the choice of one of the other worlds, would not be impossible in the metaphysical sense; it would not imply contradiction. The will, according to

<sup>61</sup> Spinoza did not include self-contradictory notions, or what were called "*chimaeras*," among the essences. A round square is merely an *ens verbale*—it cannot even be imagined, still less, of course, subsist in the order of Ideas. Cf. Spinoza, *Opera*, II, 468. Any impossible *world* would have been for Spinoza merely one of the *chimaeras*.

the principle of sufficient reason, is "always more *inclined* to the alternative which it takes, but it is not under the necessity of taking it. It is certain that it will take it without its being necessary for it to do so." Thus a residuum of contingency is supposed to be left in the universe and therewith room is found for the freedom of the will of the First Cause.<sup>62</sup>

The distinction which Leibniz here attempts to set up is manifestly without logical substance; the fact is so apparent that it is impossible to believe that a thinker of his powers can have been altogether unaware of it himself. Without abandoning all that is most essential in the principle of sufficient reason he could not possibly admit that a sufficient reason "inclines" the will without necessitating its choice, and least of all in the case of a will supposed to be enlightened by an infinite intelligence. The choice of any world other than the best would, according to propositions which Leibniz frequently and plainly lays down, be as inconsistent with the essence of deity as non-existence would be; as Leibniz admits even in one of the passages in which he is endeavoring to persuade his readers that his universe contains a real margin of contingency, "*chez le sage nécessaire et dû sont des choses équivalentes.*"<sup>63</sup> "The author of the world is free" only in a sense which is perfectly consistent with his "doing all things determinately." When Leibniz says that, upon his principles, the opposite to the actual choice would not involve self-contradiction he confuses two things. The mere *concept* of the existence of any of the inferior and non-existent worlds is, by the hypothesis, free from contradiction, if taken by itself, in abstraction from the principle of sufficient reason; but it was absolutely impossible that it should be *selected* for existence, since this would contradict both the perfection of God and the very notion of voluntary choice, of which the principle of sufficient reason is an expression.

<sup>62</sup> *Philos. Schriften*, VI, 218, 318, 413, 126; VII, 389.

<sup>63</sup> *Philos. Schriften*, VI, 386.

Nor, of course, could it be consistently maintained by Leibniz that, though the divine will was necessitated to choose the best world, the bestness of that world was conferred upon it by some spontaneous preference, some free act of valuation, on the part of the chooser. To no doctrine was Leibniz more bitterly opposed than to this. For him value was purely objective, and valuing a strictly logical process. The existence-justifying good which may be predicable of any essence or collection of essences is one of its inherent properties, known, indeed, by the divine reason, but belonging to the realm of essential or metaphysical necessity which is prior to will and regulative of it. The worth of an object is involved in its Idea in precisely the same way in which divisibility by other whole numbers without a remainder is involved in the Ideas of certain whole numbers.<sup>64</sup> If, then, God had pronounced any other world best, he would have contradicted himself as absolutely as if he had asserted that four is not a multiple of two; in other words, both were equally impossible to him, and therefore the existence of any other scheme of things than the one which actually exists was from all eternity impossible.

An absolute logical determinism, then, is as characteristic of the metaphysics of Leibniz as of that of Spinoza, though the reasons why it is are somewhat more complicated in the former case, and though Leibniz lacked the candor and courage to express the certain, and almost obvious, outcome of his reasonings, in his more popular writings, without obscuring it by misleading if edifying phraseology—especially by the verbal distinction, absolutely meaningless in the light of his other doctrines, between “necessitating” and “infallibly inclining” reasons.

<sup>64</sup> *Philos. Schriften*, VI, 423 (from the criticism of King's *De Origine Mali*). Cf. also VI, 219; and VII, 311: *Ratio veritatum latet in rerum ideis quae ipsi divinae essentiae involvuntur*; it is for this reason that it is an error to suppose *rerum bonitatem a divina voluntate pendere*. This would be similar to saying that “the truth of the divine existence depends upon the divine will.”

The real meaning, in his system, of the principle of sufficient reason thus resolves itself into the proposition that the existence of everything that does exist, and also its attributes, behavior, and relations, are determined by a necessary truth, or a system of such truths. The reasonableness of the universe which the formula affirms is, as with Spinoza, of the same type as the reasonableness of a geometrical system—as geometrical systems were conceived by seventeenth-century logic. This could hardly be more plainly and emphatically declared than it is by Leibniz himself in one of the most important of his shorter writings, *On the Primary Origination of Things* (*De rerum originatione radicali*, 1697).

In reality we find that all things in the world take place (*fieri*) according to the laws of eternal truths, not only geometrical but also metaphysical, that is, not only according to material but also to formal necessities; and this is true not merely generally, with respect to the reason, already explained, why the world exists rather than does not exist and why it exists thus rather than otherwise; but even when we descend to the details we see that metaphysical laws hold good in a wonderful manner in the entire universe. . . . Thus, then, we have the ultimate reason of the reality both of essences and existences in one being, which is necessarily greater than the world itself, and superior and antecedent to it.<sup>65</sup>

The same cosmical determinism is manifest in a logical thesis of Leibniz most plainly expressed in certain writings of his published only within the past fifty years. This thesis is that all contingent truths are ultimately reducible to *a priori* or necessary truths. We, no doubt, because of the limitations of our human understanding, cannot, in many cases, accomplish this reduction; the distinction between the necessary and the contingent expresses a genuine and persistent difference between the ways in which

<sup>65</sup> *Philos. Schriften*, VII, 305.

certain specific truths present themselves to our minds. A judgment which appears to us as contingent could by itself be shown to be necessary—i. e., to be simply the expression of the essential meaning or “nature” of the notions contained in it—only through an analysis of those notions which would proceed *in infinitum* and is therefore impossible to a finite mind. But though we are unable to attain an intuitive apprehension of the necessity, in the specific instance, we can nevertheless be sure that the necessity is there, and is recognized by the mind of God, who sees all the natures and their relations through and through in a single perfect intuition or *scientia visionis*. Unless thus ultimately reducible to necessity no proposition can, according to Leibniz, be true at all; for the truth of a proposition can mean only “the inherence of its predicate in its subject” directly or indirectly, so that the subject would not be itself without that predicate.<sup>66</sup> In other words, no judgment is true unless its opposite is—to a sufficiently analytic and sufficiently comprehensive intelligence—a self-contradiction. And the equivalence of this proposition to the principle of sufficient reason is explicitly stated: the *vérité primitive que rien n’est sans raison* is said to be synonymous with the proposition that “every truth has a proof *a priori* drawn from the notion of its terms, though it is not always in our power to carry through this analysis.”<sup>67</sup> Not only by its clear implications, then, but by some of the formal definitions of it,

<sup>66</sup> *Philos. Schriften*, II, 56; cf. also VII, 200, 309, 311; and in Couturat’s collection of *Opuscles et fragments* (1903), 518 f. and 1–3. I cite part of the last: “Veritas est, inesse praedicatum subjecto. Ostenditur reddendo rationem per analysin terminorum in communes utrique notiones. Haec analysis vel finita est, vel infinita. . . . Series infinita a Deo perfecte cognoscitur,” etc. In this passage, however, Leibniz, presumably to avert the charge of determinism, gives an unusual meaning to “necessary,” making it equivalent to “demonstrative,” i. e., capable of reduction to an intuited necessity *by us*. That it is an intuited necessity to the perfect understanding, however, the passage plainly affirms.

<sup>67</sup> *Ibid.*, II, 62 (from a letter to Arnauld, 1686).

the principle of sufficient reason is with Leibniz equivalent to the Spinozistic doctrine of the eternal, quasi-geometrical necessity of all things.<sup>68</sup>

The fact that Leibniz had failed to establish any essential difference between his "sufficient reason" and Spinoza's "necessity" was by no means unrecognized in the eighteenth century. It was pointed out at length, with perfectly sound arguments, by the Halle theologian Joachim Lange in his *Modesta disquisitio*, 1723, and in numerous other writings against the philosophy of Wolff, the systematizer and popularizer of the Leibnizian doctrines. Both Wolff and Leibniz, Lange observes, "derive creation from the nature of God as light is derived from the sun, and make it strictly essential to him and a part of his nature or necessary." The only way in which, on Leibnizian principles, anything could, without contradiction, be other

<sup>68</sup> This has been recognized and well expressed by Couturat (*Logique de Leibniz*, 1901, p. 214). Russell, on the other hand, has denied that Leibniz held the view "that the difference between the necessary and the contingent has an essential reference to our human limitations, and does not subsist for God." "Everything that is characteristic of Leibniz depended upon the ultimately irreducible nature of the opposition between existential and necessary propositions" (*op. cit.*, 1901, 61-62). Leibniz, however, as will be seen, enunciated categorically and repeatedly the opinion which Russell thinks he cannot have held. It is true that he often said things which sound, and taken literally are, inconsistent with it; and these are more "characteristic" in one sense, namely, that they make his system look more different from that of Spinoza. But he had obvious non-philosophical reasons for employing such expressions; and they are capable of being construed in a Pickwickian sense which would harmonize them with the thesis cited above. The latter, on the contrary, Leibniz had no conceivable motive for asserting unless he believed it; it is, in fact, plain that he thought it both true and fundamental; and his expression of it cannot possibly be given any sense which would admit the "ultimately irreducible nature of the opposition between existential and necessary propositions." Russell is also in error, I think, in asserting an ultimate distinction in Leibniz between the necessary and the *a priori* (*op. cit.*, 231). Cf. *Opuscles*, etc. (1903), 518.

than what it is, would be as a possibility in some other world which does not exist; in the actual world, which is also, by the hypothesis, the only world which God could conceivably have willed, everything is determined with the same "fatal necessity" as in the system of the Jewish philosopher.<sup>69</sup> A similar observation—not, perhaps, in this case, implying real disapproval—later found a place in the less orthodox pages of the *Encyclopédie*. To the immense reputation which Leibniz had in the middle of the century that work bears conclusive testimony; it remarks that "he alone confers as much honor upon Germany as Plato, Aristotle, and Archimedes together conferred upon Greece."<sup>70</sup> But, it asks:

How can Messieurs Leibniz and Wolf bring their principle of sufficient reason into accord with the contingency of the universe? Contingency implies an equal balance of possibilities. But what is more opposed to such a balance than the principle of sufficient reason? It is, then, necessary to say that the world exists, not contingently, but by virtue of a sufficient reason; and this might lead us to the verge of Spinozism. These philosophers attempt, to be sure, to escape this; . . . but it remains true that the sufficient reason does not leave contingency unimpaired. The more a plan has reasons which require its existence, the less are alternative plans possible—i.e., the less can they set up claims to existence. . . . God is the source of all created monads, which have emanated from him by continual fulgurations. . . . Things cannot be other than they are.<sup>71</sup>

<sup>69</sup> *Modesta disquisitio*, 27–67. Cf. also the Latin essays of D. Strahler (1727) and Chr. Langhansen (1727), both of which criticize Leibniz and Wolff as "pseudo-defensores contingentiae." That the principle of sufficient reason itself meant for Leibniz that every true proposition is, and by a perfect intelligence is apprehended as, reducible to "primitive" or "identical" truths, is noted by Strahler (p. 37).

<sup>70</sup> Art. *Leibnitzianisme*.

<sup>71</sup> Art. "Suffisante raison," *passim*.

The passage shows clearly that one, and perhaps the principal, tendency of Leibniz's insistence upon his principle of sufficient reason—commonly esteemed in the eighteenth century one of the great achievements of philosophy—was to promote the doctrine of universal necessity and to diminish the horror of that hobgoblin which had so terrified even Leibniz himself, the metaphysics of Spinoza.

But it may perhaps be suggested that, even though logical necessity is as absolute and pervasive in Leibniz's universe as in Spinoza's, there is still an essential difference between the two, in that for Leibniz the thing that is necessary is the realization of value; in other words, that the principle of sufficient reason, though it declares that only one world could ever conceivably *exist*, adds that this one must be the best conceivable—an addition not to be found in Spinoza. If, however, we observe what the "good" is that Leibniz regards as the ground of the existence of any particular thing, or of the actual world as a whole, we shall see that even this difference is both less and other than it at first sight appears to be. We shall at the same time see the principle of sufficient reason in the act of passing over explicitly into the principle of plenitude. There can, Leibniz often says plainly enough, be only one ultimate reason why anything exists, namely, that its essence demands existence, and will inevitably attain it unless interfered with by a similar demand on the part of some other essence; and the superiority of the actual world to all the other abstractly conceivable ones consists in the fact that in it this tendency of essences to exist is realized in a greater measure than in any of the others. An *exigentia existentiae*<sup>72</sup> is inherent in every essence; *nisi in ipsa essentiae natura quaedam ad existendum inclinatio esset, nihil existeret*. A mere "possible" is a thing frustrate, uncompleted; and therefore "every possible is characterized by a striving (*conatus*) towards existence," and "may be said to be destined to exist, provided, that

<sup>72</sup> *Philos. Schriften*, VII, 303, 305, 310.



is, it is grounded in a necessary being actually existing." True, as we have seen, not all possibles *do* attain existence, since the requirements of compossibility exclude some of them. But, with this restriction, Leibniz comes very near to applying to every essence the principle of the ontological argument. He comes even nearer than Spinoza to doing so. Spinoza's principal (though not his only) argument, it will be remembered, ran thus: given the Idea of one *directly* necessary being as a *point d'appui*, the existence of beings corresponding to all the other Ideas (within the limits of possibility) is equally necessary.<sup>73</sup> With Leibniz the *point d'appui* seems superfluous. While he is usually careful to speak of the other existents as logically dependent upon the existence of God, his emphasis upon the inherency of the *propensio ad existendum* in each essence separately is frequently so unqualified that it becomes difficult to see wherein the dependence consists. The necessity with which God exists would seem to be merely one instance—though the extreme instance—of this generic attribute of essence. The certainty of the realization of the propension in the case of the divine essence is, perhaps, due only to its exemption from the requirements of compossibility; it is an essence *hors concours*, so to say, and does not need to struggle for a place in the real world.<sup>74</sup> The issue of that

<sup>73</sup> For a denial of the idea that finite essences have of themselves a tendency to existence, cf. Spinoza's *Tractatus Politicus*, II, sec. 2.

<sup>74</sup> An earlier seventeenth-century writer, Matthew Barker, had, indeed, reversed the usual reasoning, deducing the existence of God from the necessity of a full Chain of Being, rather than the Chain of Being from the necessary existence of God: "These degrees in nature are by learned men called the Scale of Nature; and we must come to some top in the Scale or Ladder, and not ascend *ad infinitum*, though we must into infinity, which is the Infinite God . . . where there are degrees of perfection, there must needs be some greatest perfection, and what can that be but God, who is *Optimus et Maximus*, who is the most Excellent Being and the first Perfection" (*Natural Theology* (1674), 27).

struggle in the case of the other essences seems to be determined wholly by *their* properties, not by the attributes of God. Leibniz does not hesitate to represent the emergence of the actual from among the possible worlds as the result of a quasi-mechanical process in which the world carrying the greatest weight of potential being inevitably pushed through to actuality.<sup>75</sup>

From the conflict of all the possibles demanding existence, this at once follows, that there exists that series of things by which as many of them as possible exist; in other words, the maximal series of possibles. . . . And as we see liquids spontaneously and by their own nature gather into spherical drops, so in the nature of the universe the series which has the greatest capacity (*maxime capax*) exists.<sup>76</sup>

Leibniz wavers, it is true, between two possible ways of taking this notion of "maximal capacity." He necessarily admitted a gradation among the essences, of which the graded scale of monads, with God at the summit of the scale, was the expression. And he not infrequently seems to imply that, because of their differing "degrees of perfection," some essences may have a greater claim, or a more potent tendency, to existence than others. Thus the fullness of the actual world would be rather intensive than extensive; it would be measured by the rank, or degrees of excellence, of its component members, and not merely by their number. The following passage illustrates this way of construing the notion:

The sufficient reason for God's choice can be found

---

Substantially the same argument has recently been independently advanced by Professor W. H. Sheldon, *Philos. Rev.* (1923), 355 ff.

<sup>75</sup> *Philos. Schriften*, VII, 304; cf. 303: "It is most evident that, out of the infinite combinations of possibles and the infinite number of series, that one exists *per quam plurimum essentiae seu possibilitatis producitur ad existendum*." Cf. also Couturat, *op. cit.* (1901), 226.

<sup>76</sup> *Philos. Schriften*, VII, 290; cf. also 304, and Couturat, *op. cit.*, 224-25.

only in the fitness (*convenience*) or in the degrees of perfection that the several worlds possess, since each possible thing has the right to aspire to existence in proportion to the amount of perfection it contains in germ.<sup>77</sup>

But though Leibniz, undeniably, often inclines to this sort of phraseology in the popular writings with which eighteenth-century readers were most familiar, the view it suggests was not logically open to him, and is not in fact carried out in his account of the actual constitution of the world. If it be assumed that the essence man "contained in germ" many times the "amount of perfection" attaching to the essence crocodile, and if it be further assumed (as by Leibniz it is) that the rules of compossibility forbid that two bodies should occupy the same space, then it would seem, according to the passage last cited, that a world containing only men and no crocodiles would be better than one containing both, since the crocodiles would certainly require matter and occupy space which might be devoted to the uses of human beings. But this is precisely the conclusion which Leibniz does not draw. As the author of a theodicy he is concerned to justify crocodiles; he must show that the principle of sufficient reason requires that—once more, within the limits of compossibility—these creatures and all the other possible links in the Chain of Being, down to the lowest, shall really exist. What may, then, be called his actual working theory on the subject is that of equal rights among essences as claimants for existence. "To say that some essences have an inclination to exist and others do not, is to say something without reason, since existence seems to be universally related to every essence in the same manner."<sup>78</sup> And the superiority of the actual world consists in the *number* of different essences—in other words, in the variety of types—realized in it, not in their metaphysical rank or qualitative excellence. "Perfection is to be

<sup>77</sup> *Monadology*, 54; *Philos. Schriften*, VI, 616.

<sup>78</sup> *Philos. Schriften*, VII, 195.

placed in form [i. e., as the context shows, in *quantity* of forms], or variety; whence it follows that matter is not everywhere uniform, but is diversified by assuming different forms; otherwise, as much variety as possible would not be realized. . . . It follows likewise that that series prevailed through which there could arise the greatest possibility of thinking of things as distinct (*distincta cogitabilitas*)."<sup>79</sup> "The actual universe is the collection of the possibles *qui forment le plus riche composé*."<sup>80</sup> "We must say," writes Leibniz to Malebranche, "that God makes the greatest number of things that he can"; and it is precisely for this reason that the *laws* of nature are as simple as possible; by means of such laws God was able "to find room for as many things as it is possible to place together. If God had made use of other laws, it would be as if one should construct a building of round stones, which leave more space unoccupied than that which they fill."<sup>81</sup> Thus even the scientific assumption that the simplest explanatory hypothesis is always to be preferred appeared to Leibniz—though the connection is hard to follow—as a corollary of the principle of plenitude.

The "good," then, for the sake of which, and by reason of which, things exist, is simply existence itself—the actualization of essence; and the world that in the eternal nature of things was necessitated to be, was the world in which "the quantity of existence is as great as possible."<sup>82</sup> Thus the difference between Leibniz's nominal assertion and Spinoza's denial of final causes approaches the vanishing point. There are, of course, in Leibniz plenty of passages dilating in the conventional way upon the evidences of design in nature, the "fitness" of everything to everything else, and to man's advantage, in particular.<sup>83</sup> But

<sup>79</sup> *Philos. Schriften*, VII, 290-91.

<sup>80</sup> *Ibid.*, III, 573.

<sup>81</sup> *Ibid.*, I, 331. Cf. VII, 289: "Dici potest omne possibile existiturire, prout scilicet fundatur in Ente necessario."

<sup>82</sup> *Ibid.*, VII, 304.

<sup>83</sup> An extreme example is the *Tentamen Anagogicum* (*Philos. Schriften*, VII, 270 ff.).

his fundamental view, expressed in his most methodical and comprehensive summaries of his doctrine, was that each thing exists, not primarily for the sake of other things, not as an instrument to an ulterior good, but because its essence, like every essence, had its own underivative right to existence. And since this is realized (so far as it is possible) by logical necessity, and since its realization differs from what Spinoza had represented as following *ex necessitate divinae naturae* only by the limitations inherent in the rule of impossibility, the metaphysical outcome of the two arguments is still essentially the same.

Nevertheless, the difference between the Leibnizian and Spinozistic ways of putting what was, in logical substance, the same fundamental metaphysics, was historically important. Where Spinoza had (ostensibly) asserted that the realization of the principle of plenitude, being necessary, cannot properly be called either good or bad, Leibniz declared that, while necessary, it is also supremely good; he thereby gave to that principle (without qualification) the status of a doctrine about value as well as (with a qualification) that of a doctrine about the constitution of reality. Spinoza, as we have seen, appears more interested in the thought of the necessity of the universe than in the thought of its plenitude. Leibniz was genuinely interested in both aspects of this dialectic; but he was also somewhat afraid of the cosmic determinism to which it led him, while in the notion of the cosmic "fullness" he took, and he tended to impart to his readers, a lively imaginative and emotional satisfaction.

The qualification to which the principle of plenitude was subject when taken as a generalization about reality did not, in the concrete application of Leibniz's metaphysics to questions lying within the purview of natural science, prove to be of much consequence. Though he had affirmed the reality of a *vacuum formarum*, i. e., of the non-existence of some possibles, it was a vacuum lying wholly outside the particular series of forms which defines the world that actually exists. Within this world no gaps

of any sort could be admitted; Leibniz had a *horror vacui* which he was certain that Nature shared. In its internal structure the universe is a *plenum*, and the law of continuity, the assumption that "nature makes no leaps," can with absolute confidence be applied in all the sciences, from geometry to biology and psychology. "If one denied it, the world would contain hiatuses, which would overthrow the great principle of sufficient reason and compel us to have recourse to miracles or pure chance in the explanation of phenomena." What this means, of course, is that since the general types of entity actually found in the world must obviously be possible and compossible, and since (as Leibniz somewhat uncritically assumes) all species of those types must be equally possible, then the absence from reality of any such species would amount to an arbitrary, which is to say a fortuitous, exclusion of a possible from existence—the inconceivability of which to Leibniz needs no further exposition.<sup>84</sup>

The principle of plenitude, and that of continuity as a special form of it, involve him in some embarrassment when he comes to consider the two questions of the existence of matter and of the possibility of physical vacua, the latter a topic still much debated among physicists during his lifetime. In some passages he comes near to deducing from these principles, as Archbishop King had

<sup>84</sup> Russell seems curiously to miss the point when he writes: "Why Leibniz holds that substances form a continuous series it is difficult to say. He never, so far as I know, offers the shadow of a reason, except that such a world seems to him pleasanter than one with gaps." (1901, p. 65.) The reason, as indicated above, is the same as the reason for believing that there is a reason for anything—namely, that the alternative would be a world of chance. Leibniz's aversion from the latter supposition is, no doubt, as I have suggested, at bottom pragmatic, but it is not unintelligible nor merely whimsical. Let a single gap be supposed in the Chain of Being, and, according to his logic, the universe would by that alone be shown to be non-rational, and therefore utterly untrustworthy.

done, a proof of physical realism.<sup>85</sup> God *must* have created real matter, since if he had not, there would be not only an unrealized possibility of existence, but also a lack of coherency in things: "if there were only minds, they would be without the necessary connection with one another (*liaison*), without the order of times and places." This order "demands matter and motion and the laws of motion." And if there is to be any matter at all, then it must be continuous; there can be no empty spaces where matter might have been but is not. Leibniz therefore vehemently attacked the physical vacuists. But on the other hand, he found reasons, which it is not needful to set forth here,<sup>86</sup> for concluding that space is merely the "order of coexistences," a form in which entities not really extended appear sensibly to one another; and with this the material world, as conceived by ordinary physical realism, goes by the board, and material bodies are reduced to the equivocal status already mentioned. The principle of plenitude, in short, here comes into conflict with certain other dialectical motives which played an important part in Leibniz's thought, and, at this particular point, gets the worst of it.<sup>87</sup> When, from this point of view, he still continues to criticize the believers in the vacuum, it is not because they hold that empty spaces exist somewhere, but because they hold that real spaces exist at all.<sup>88</sup> Meanwhile, of the reality of which matter is the manifes-

<sup>85</sup> In his comment upon King's book Leibniz expressly approves this argument. (*Philos. Schriften*, VI, 172-73.)

<sup>86</sup> One of the arguments against real space is itself derived from the principle of sufficient reason; v. Leibniz's third letter to Clarke (*Philos. Schriften*, VII, 364).

<sup>87</sup> He also argues against the vacuum on the ground of the identity of indiscernibles. Between two regions of empty space there would be no difference whatever, and therefore they would not be distinct regions. They are supposed (by vacuists) to differ "*solo numero*, which is absurd." (*Opuscules*, etc., ed. Couturat, 1903, p. 522.)

<sup>88</sup> Cf. *Philos. Schriften*, IV, 368; VII, 363; and *A Collection of Papers*, 103.

tation, the denial of the possibility of any vacuum holds good literally; nature is everywhere teeming with life, all of it accompanied with some degree of sèntiency. "There is," Leibniz writes in the *Monadology*, "nothing fallow, nothing sterile, nothing dead in the universe"; and again elsewhere: "If there were a vacuum, it is evident that there would be left sterile and fallow places in which, nevertheless, without prejudice to any other things, something might have been produced. But it is not consistent with wisdom that any such places should be left."<sup>89</sup> "In every particle of the universe a world composed of an infinity of creatures is contained."<sup>90</sup>

But, as the metaphysical argument already outlined implies, it is not of mere quantity or numbers that Nature is thus insatiably avid; it is essentially the maximization of diversity that she seeks, the multiplication of species and sub-species and differing individuals to the limit of logical possibility. "Just as there is no vacuum in the varieties of the corporeal world, so there is no less variety among intelligent creatures."<sup>91</sup> Some notable consequences drawn from this aspect of the principle of plenitude in the eighteenth century we shall observe in later lectures.

<sup>89</sup> *Math. Schriften*, ed. Gerhardt, III, 565; tr. by Latta in *The Monadology*, etc. (1925), 257.

<sup>90</sup> *Opuscles*, etc. (1903), 522.

<sup>91</sup> *Nouveaux Essais*, III, 6, 12.



# LEIBNIZ ON POSSIBLE WORLDS

BENSON MATES

When defining logical truth in terms of interpretations or models, logicians frequently make reference to the Leibnizian idea that a proposition is a necessary truth if and only if it is true of all possible worlds. The same idea is usually mentioned in discussions of the semantics of modal logics. As soon as one looks a bit further into the matter, however, it becomes apparent that the concepts of 'possible world' employed by modern investigators are quite different from that of Leibniz himself; and although perhaps this is all to the good, there may be some interest in considering what the effect would be if a more strictly Leibnizian approach were followed.

The present paper describes certain features of the Leibnizian conceptual framework and attempts to incorporate them in the semantics of a formalized language. Specifically, the formal system to be discussed will be a first order monadic predicate calculus with identity and necessity, and also with individual constants that do not in all cases denote. A similar system without the modal operator will be considered in an auxiliary way.

Although in presenting Leibniz's views I have done my best to stick to the strict historical truth, the reader who

From B. van Rootselaar and J. F. Staal, eds., *Logic, Methodology, and Philosophy of Science III*, (Amsterdam: North-Holland Publishing Company, 1968). Reprinted by permission of the author and the publisher.

is unfamiliar with the subject should be warned that for the most part we are working not from treatises but rather from a large number of notes and other bits and pieces, written over a long period of time and apparently not intended for publication. It is unreasonable to expect such fragments to present a complete and coherent doctrine. There are Leibnizian statements that I do not know how to reconcile with the interpretation here offered; where I am aware of these I mention them in footnotes or other references. It also should be mentioned at the outset that clearly the formalized language toward which Leibniz was moving would have been more like that of Lesniewski than like the Fregean systems employed by most logicians today, and inevitably a certain amount of distortion is involved in attempting to apply his ideas to a type of language he never considered. Nevertheless I believe that such application is not without interest.<sup>1</sup>

# I

1. The general outlines of Leibniz's doctrine of possible worlds are well known to every philosopher. Especially striking is the way in which matters of logic, metaphysics, and theology are interwoven. Leibniz tells us that the actual, existent world is only one of infinitely many possible worlds that *could* have existed (G II 40).<sup>2</sup> It is, indeed, the *best* of these possible worlds, in the sense that any alteration whatsoever, taken together with all its ramifications, would be a change for the worse; and of course that is why God chose to make actual this particular world rather than one of the others. The distinction between

<sup>1</sup> For reasons of space I have not attempted to make clear in detail the relevance of my discussion to the recent literature on the same subject. In the list of references, however, I have listed a number of books and papers that set forth ideas to which the views of Leibniz are highly germane.

<sup>2</sup> To decipher the citations, see the list of references at the end of this article.

the actual world and the various other possible worlds is associated with certain philosophically significant classifications of statements or sentences. Instead of employing a simple dichotomy between truth and falsehood, Leibniz in effect relativizes these concepts to possible worlds. Given a sentence and a possible world, the sentence is said to be true or false of that possible world. Thus, the sentences, 'Caesar crossed the Rubicon' and 'Adam was the first man', are true of the actual world but false of infinitely many other possible worlds. (In fact, it turns out that they are true of the actual world *only*, as will be discussed in the sequel.) On the other hand, the sentence, 'Either Caesar crossed the Rubicon or he didn't', in the sense that either it is or it is not the case that he did, is true not only of the actual world but of all possible worlds. Such sentences are called by Leibniz *necessary truths* ('truths of reason', 'eternal truths', cp. C 18, NE 714). Sentences true of the actual world but not of all possible worlds are *contingent truths* ('truths of fact').<sup>3</sup>

Following the usage of Russell (R 32), we say that a sentence is true or false of a possible world rather than *in* it. The truth value of a sentence relative to a possible world does not depend upon what would have happened to the language, or to that sentence in particular, if the given possible world had been made actual. Thus the sentence, 'there are no sentences', is presumably true of some possible worlds (though not *in* one); and although no sentence is itself a necessarily existent substance or has a necessarily fixed sense, some sentences are true of all possible worlds.

## 2. Attributes and concepts

If, seeking to come to closer quarters with the subject, we now raise the heuristically useful (though in other

<sup>3</sup> Usually, however, Leibniz *defines* a necessary truth as 'one the contradictory of which involves a contradiction' (e.g., at S 480).

ways suspect) question, "What, exactly, is a possible world?", difficulties appear at once. Leibniz's stock answer seems to be that a possible world is a collection of individuals. But of course the only actually existing individuals (i.e., the only individuals) are the ones that constitute the actual world, and thus we seem led to the unsatisfactory conclusion that the number of nonactual possible worlds is either 1 or 0. Many philosophers try to restore the desired multiplicity by saying that in addition to the actual individuals, which exist, there are also some entities called 'possible individuals', which 'subsist'. Upon occasion Leibniz himself talks this way and gives the appearance of believing the associated doctrine (cp. G III 573). It seems to me, however, that his metaphysics offer him another and somewhat more satisfactory method of handling the problem.

Consider, for example, a name like 'Adam', which denotes an individual existing in the actual world, and compare it with a name like 'Pegasus', which does not (but for which there *could* have been a corresponding individual). Associated with the name 'Adam' there is, according to Leibniz, not only Adam himself but also the so-called *complete individual concept of Adam*, which is said to 'involve' all of Adam's attributes, including everything that has ever happened to him and everything that will happen to him, as, for example, that he will have such and such progeny (G II 42, G II 131, G IV 437, S 475, S 477).<sup>4</sup> With the word 'Pegasus', on the other hand, there is associated a complete individual concept but no corresponding individual (cf. C 53). The concept of Pega-

<sup>4</sup> In connection with this we may note that if essentialism is the doctrine that distinguishes 'some traits of an object as essential to it . . . and other traits of it as accidental' (Quine [1963] p. 104), then Leibniz is no essentialist. It seems that in effect he chooses the alternative of regarding *every* trait of an object as essential to it, and what saves the contingency of synthetic truths about the object is only the fact that the object might not have existed at all.

sus (and it will be noticed that here and at other essential points in this discussion we are forced to quantify or abstract into oblique contexts) contains all the attributes Pegasus would have had if he had existed.<sup>5</sup> Leibniz seems to hold that corresponding to every significant proper name<sup>6</sup> there is a complete individual concept, which is such that it *might* be exemplified by an individual. Usually he limits the attributes under consideration to what he calls 'simple' attributes—i.e., to attributes that cannot be 'analyzed' or 'explicated' in terms of other attributes. Thus a complete individual concept is a set of (or an attribute composed of) simple attributes jointly satisfiable by exactly one individual; it is 'complete' in the sense that it contains every simple attribute such an individual would have. Since all the attributes of an individual substance are presumed to be analyzable, or resolvable, into simple ones, a complete individual concept is complete also in the sense that every attribute a corresponding individual would have is 'deducible' from the set of attributes constituting the concept (G IV 432, S 475, S 478).

All simple attributes are 'positive', while complex attributes are composed of the simples by negation and (possibly infinite) conjunction (cp. C 35). Leibniz says further, 'all purely positive terms are compatible *inter se*' (S 480, G VII 195, R 20n). It is not easy, if this is true, to see how there can be more than one complete individual concept. But Leibniz seems worried by a different difficulty. When he speaks of the 'compatibility' of positive attributes, he evidently has in mind something more like their independence; he cannot understand how one object's having a positive attribute *P* can logically imply or exclude

<sup>5</sup> Or, perhaps, all the attributes an object must have if it is properly to be called 'Pegasus', where the word 'properly' carries such a metaphysical load that only Pegasus can *properly* be called 'Pegasus'.

<sup>6</sup> Apparently this does not apply to names of mathematical objects, which latter are considered by Leibniz to be 'abstract' and 'nonreal' (cf. C 8).

another object's having a positive attribute *Q*. He decides that this is one of those mysteries understandable by God but not by man.<sup>7</sup>

Some of these details are irrelevant to the exegetical suggestion I wish to make here, which is only that we interpret the term 'possible world' as referring for Leibniz to a set of individual concepts, and not to a set of individuals. In that way he can avoid introducing a shadowy realm of 'possible individuals' in addition to the abstract entities (i.e., the attributes and concepts) already involved in his metaphysics.<sup>8</sup> We may note that since in the case of the actual world there is a 1-1 correspondence between the individual concepts and objects exemplifying them, there will sometimes be no harm in speaking of that world as though it were a collection of individuals (cf. G VII 303).

### 3. *Compossibility*

Individual concepts are said to be *compossible* if they are capable of joint realization. Thus, on the interpretation here proposed, a possible world is a set of mutually compossible complete individual concepts. It is 'maximal' in the sense that it contains every complete individual concept that is compossible with the ones it contains. We are told explicitly that, just as there are infinitely many possible worlds, so there are infinitely many elements in each possible world (T 128, T 267, but cf. C 360) and infinitely many attributes in each individual concept (G IV 432, G V 268, NE 309).

Distinctively Leibnizian is the view that in the actual

<sup>7</sup> One is reminded of the problem faced by Professor Carnap when, endeavoring (in *Meaning and necessity*) to explicate logical connections (including logical independence) in terms of his L-concepts, he found that in defining these L-concepts he had to stipulate explicitly that the atomic sentences of his language were *inter se* logically independent.

<sup>8</sup> There is a considerable amount of indirect textual support for this interpretation.

world, and in every other possible world, each individual concept is interlocked with each of the other individual concepts in that world; each 'mirrors' all the others (G II 112, G II 40, R 132, R 205, NE 716, C 15, C 19). Making the same point in another way, Leibniz says that each individual of the actual world is related to all of the others, and every relation is 'grounded' in simple properties of the things related; the other possible worlds are similarly constructed (T 128).

Thus, for example, consider again the individual concept of Adam. Contained in this concept are one or more simple properties that are the ground (as concerns Adam) of the truth of the proposition, 'Adam was the father of Cain' (cp. G II 37). If Adam had not been the father of Cain, Adam would not have been the same Adam; more exactly, Adam would not have existed (T 128). Similarly, if Cain had not been the son of Adam, *he* would not have existed. Putting the matter in still another way, any concept that does not contain the simple attributes that are the basis of Adam's being the father of Cain is not the concept of Adam. The concepts of Adam and Cain are connected in this manner; so are those of Cain and Abel; and the same is true of every other collection of concepts in every possible world (cf. G II 42 ff., T 168).

One sees, therefore, that the relation of compossibility between individual concepts, unlike that of consistency between sentences or propositions, is transitive;<sup>9</sup> since it is also reflexive and symmetrical it is an equivalence relation. As noted above, the possible worlds are 'maximal' or 'closed' with respect to this relation; so they are just the equivalence classes into which the relation of compossibility partitions the entire class of complete individual concepts. Thus, each such concept belongs to one and only one possible world (G III 573, R 66, T 371, but cf. G VII 194, T 146), and two concepts are compossible if and only if they belong to the same possible world.

<sup>9</sup> This crucial point was explicitly noted for the first time, so far as I know, by Rescher (*Philosophy of Leibniz*, p. 17).

As is well known, Leibniz believed these matters to possess important theological aspects. He argues that in creating the actual world God did not have a choice as to whether Judas should be a betrayer, but only whether Judas-who-was-going-to-be-a-betrayer should exist. Otherwise expressed, the point is that there are not two possible worlds, in one of which Judas betrays Christ and in the other of which he does not. God cannot be charged with having decided that Judas should sin. He did decide, however, that *Judas peccaturus* should nevertheless exist, "since He saw that this evil would be immensely outweighed by greater goods and that there was no better way" (C 24). "If the smallest evil that comes to pass in the world", Leibniz says in another place, "were missing in it, it would no longer be this world; which, with nothing omitted and all allowance made, was found the best by the Creator who chose it" (T 128, T 10).<sup>10</sup>

The point under discussion is also relevant to God's omniscience. Since "all things are connected in each one of the possible worlds" and "the universe, whatever it may be, is all of one piece, like an ocean: the least movement extends its effect there to any distance whatsoever" (T 128)—since this is so, "God sees in each portion of the universe the whole thing . . . He is infinitely more discerning than Pythagoras, who judged the height of Hercules by the size of his footprint" (T 341). This capacity of God's is but the limit of a similar property Leibniz thought he had noticed in men: "the wiser a man is, the less detached intentions he has, and the more the views and intentions he does have are comprehensive and interconnected" (G II 19).

There is also a grammatical aspect to the matter. It seems evident that for Leibniz the plausibility of his doctrine on this point is intimately connected with a certain grammatical transformation that in most cases is permis-

<sup>10</sup> On the other side, Diodorus's view, that everything possible happens, is put down by Leibniz as due to a confusion of *possible* with *compossible with what exists* (G III 572 ff., E 654).



sible in Latin but seems to have no simple counterpart in English. In general, he tells us (C 375), to say

A est B

is the same as to say

AB est existens;

e.g., to say

Petrus est abnegans

is to say

Petrus abnegans est existens.

Thus every simple question about an individual is transformed into a question of existence. Note, for future reference, that as a special case

A est A

is transformed into

AA est existens,

i.e., into

A est existens.

It is worth noting that there is a lack of symmetry between the ways in which individuals and attributes of individuals are treated, as concerns the question whether their identity is preserved from one possible world to another. According to Leibniz it is not possible that a given individual should have had attributes other than the ones he does have. But it is possible that a given attribute should have characterized individuals other than the ones it does characterize. Thus, although no individual concept is part of two possible worlds, the attributes that constitute concepts are the same from one world to another. (Indeed, Leibniz sometimes talks as though every attribute is part of some individual concept in each possible world.) This seems to imply that an attribute may characterize an individual or belong to his concept without itself having the (an) attribute of characterizing that individual or belonging to his concept. Adam is a man, so Adam's concept involves the attribute of manhood, but the attribute manhood does not have the attribute of being involved in

Adam's concept. If it did, then manhood would not be the same in any possible world to which the concept of Adam did not belong. In other words, no men could have existed other than the ones who do.

(In this regard classes appear to fare like individuals and differently from attributes. If Adam had not existed, the class of men would not have been the same, although the attribute presumably would have been unaffected. We can say intelligibly, "Suppose that there had been fewer men than there are", and metaphysicalize this into, "Suppose that the attribute of manhood had belonged to fewer objects than it does". But if we say, "Suppose that the class of men had contained fewer elements than it does", our remark hardly can be understood in the sense of "Suppose that this very class, which has so-and-so many elements, had had fewer elements". It seems intelligible only when taken in the sense of, "Suppose that the attribute of manhood had belonged to fewer objects and so that the class determined by this attribute had had fewer elements than the class it actually does determine".)

4. We come next to the principle, *Nihili nullae proprietates sunt* ("Nothing has no properties"), a Scholastic maxim asserted by Leibniz on many occasions. It does not mean, of course, that there is something called 'nihil' and which has the remarkable property of having no properties at all. Nor, I believe, is its force brought out by rephrasing it as, "Everything has some property", for that seems to be as completely trivial a metaphysical proposition as will ever be found. The point is rather that Leibniz's advocacy of this principle amounts in practice to a decision to regard as false every atomic sentence that contains a non-denoting name. Since, for him, existence is a predicate (NE 401), so that  $\ulcorner A \text{ exists} \urcorner$ , where  $A$  is a name, is an atomic sentence, this in turn amounts to asserting the following:

A singular name  $N$  is non-denoting if and only if every atomic sentence containing  $N$  is false. (Here cf. C 393 # 153, S 478, C 252, S 474, NE 516.)

Other formulations of the principle and discussions of it substantiate the proposed interpretation. For example, in one place it appears in the form, *Non entis nulla sunt attributa*, i.e., "what does not exist has no properties". And at nearly every occurrence it is found in some such context as:

Suppose that . . . *N* is not *A*, *N* is not *B*, *N* is not *C*, etc.: then *N* is called *Nothing*. From this definition there follows the common saying that 'Nothing has no attributes' (S 472, cf. C 252, C 356, S 474).<sup>11</sup>

Leibniz explicitly rejects the possibility of saying that atomic sentences containing nondenoting terms are neither true nor false. In one place, where the context shows that only atomic sentences are under consideration, he states:

In order, namely, to keep (the principle) that every proposition is true or false, (I consider) as false every proposition that lacks an existent subject or real term (C 393).

Leibniz also makes it clear that although such atomic sentences are false, their negations and many other compounds containing them are true. He goes on to say that

<sup>11</sup> As the passage just quoted shows, the simple sentences Leibniz has in mind are of the form ' $\neg A$  is  $B$ ', where the argument positions may be occupied by singular or general terms. The formal system toward which he was moving was probably more like that of Lesniewski than like the Fregean-style predicate calculi employed by most logicians today. When he says ' $\neg N$  is Nothing' he means in effect not only that *N* denotes nothing at all if *N* is a singular term (like 'Pegasus'), but also that *N* denotes the empty set if *N* is a general term (like 'man twenty feet tall') (cf. Couturat [1901] p. 348, n2). Consequently, it would be more accurate to say that *part* of the point of *Non entis nulla attributa sunt*, as understood by Leibniz, is that a singular name is nondenoting if and only if every atomic sentence containing it is false.

However, Couturat (*loc. cit.*) is surely mistaken in supposing that by 'nihil' Leibniz *always* meant the empty set and hence

while such a procedure may not be consonant with ordinary usage, there is no reason for him to care about *that*, for he is engaged in finding a suitable notation (*propria signa*), not in trying to establish the application of existing terminology (*recepta nomina*) (*loc. cit.*, cf. C 188, C 272, 273).

The idea of considering atomic sentences false if they contain singular terms that fail to name has of course occurred to many other philosophers and logicians.<sup>12</sup> No doubt the most obvious objection to this procedure is based upon the consideration that what is expressed by an atomic sentence in one language may be expressed by a complex sentence in another. Or, even in the same language, there may be cases in which an atomic sentence seems synonymous with a sentence that is not atomic. Thus it might be felt awkward to declare that 'Zeus is bald' is false while at the same time insisting that 'Zeus does not have hair on his head' is true. Probably Leibniz's reply to this sort of objection would be to reiterate his view<sup>13</sup> that in the realm of thought, as in that of language, there is a complex and a simple, and that the ideal language he is seeking will associate signs with thoughts in such a way that signs for complex thoughts will be composites of the signs for their parts. "The law of expressions is this", he says, "that the expression for a given thing shall be composed of the signs of those things the ideas of which compose the idea of the given thing". So the point is that in an ideal language, to which alone Leibniz intends his considerations strictly to apply, atomic sentences express the 'atomic thoughts', and hence difficulties of the type mentioned above cannot arise.<sup>14</sup>

---

should have defined it as 'the term that is included in every term'. Couturat also argues mistakenly that for Leibniz *non-ens* means *the impossible*; on this cf. Parkinson, *Papers*, p. lvii.

<sup>12</sup> Cf., e.g., Quine, *Logical Point of View*, pp. 166-67.

<sup>13</sup> A view that is as unintelligible as it is common.

<sup>14</sup> Also, Leibniz thought that the more perfect a language is, the more of its inferences will be formal; from this point of view

Note that once again we have the consequence that if the singular term *A* fails to name, then the sentence ' $A$  is *A*' is false.

### 5. Identity

Leibniz's views on identity are central to his entire metaphysics. His most widely known pronouncement on this topic is his principle, "Things are the same if it is possible to substitute one for the other everywhere *salva veritate*" or "That *A* is the same as *B* means that the one may be substituted for the other in any proposition whatsoever *salva veritate*". It is usual to point out that these (and other) formulations given by Leibniz seem to involve a confusion of sign and object.<sup>15</sup> Perhaps he should have said something like one of the following:

(1) For any names *N* and *N'*: the sentence ' $N = N'$ ' is true if and only if *N* and *N'* are everywhere interchangeable *salva veritate*: or

(2) For any objects *A*, *B*: *A* is identical with *B* if and only if *A* and *B* have all their attributes in common; or

(3) For any objects, *A*, *B*: *A* is identical with *B* if and

---

he says he prefers binary notation in arithmetic, because e.g. ' $3 \times 3 = 9$ ' can be demonstrated by

$$\begin{array}{r} 11 \\ 11 \\ \hline 11 \\ 11 \\ \hline 1001 \end{array}$$

cf. Kneale and Kneale, *Development*, pp. 327 ff.

<sup>15</sup> See Quine, *Word and Object*, pp. 116, 117. Quine mentions formulations by Aristotle and Aquinas. Cf. also Sextus Empiricus, *Hyp. Pyrrh.* II, p. 229. The question whether Leibniz was in fact guilty of a use-mention confusion is not quite easy, since it could be argued that he was defining the identity of concepts (not objects) in terms of some sort of 'interchangeability' of these in propositions (not sentences). At NE 379 ff., Leibniz inveighs against 'confusing words and things'.

only if every predicate expression that is true of *A* is true of *B* and conversely.

In connection with the features of Leibnizian philosophy under discussion here, the seemingly slight differences among these three formulations are by no means without important effect. Principle (1) leads to the result that every sentence of the form ' $N = N$ ' is true, whether or not *N* denotes an object existing in the actual world, i.e., an object. (And it is reasonably clear that for Leibniz not all names denote.) On this basis '*Pegasus* = *Pegasus*' would be true of the actual world even though *Pegasus* does not exist. The initial quantifiers of formulations (2) and (3), on the other hand, run over (existent) objects; thus these forms of the principle yield no conclusions about the truth or falsity of sentences such as the one just mentioned. As indicated earlier, other statements by Leibniz suggest that he was inclined to regard these identity sentences as *false* of the actual world, and, in general, to think that ' $N = N$ ' is to count as false of any possible world not containing the concept associated with *N*. Indeed, this follows (as he notes) from the doctrine of the previous section plus the plausible assumption that self-identity is a simple attribute. Furthermore, at several places Leibniz explicitly interprets ' $AB \neq AB$ ' as '*AB* does not exist' (C 393; cf. K 181). It must be acknowledged, however, that on one occasion he adds the curious remark, "When everything is taken into consideration, though, it is perhaps better to say that we can indeed always *write*  $A = A$  but that when *A* does not exist nothing useful can be concluded therefrom".

Often the identity of things and the identity of their concepts seem imperfectly distinguished by Leibniz, and I am inclined to think that this is because his doctrine implies that individuals (of the actual world) are identical if and only if their corresponding individual concepts are identical. In a very interesting passage he writes:

. . . Thus '*Alexander the Great*' and '*King of Macedonia*' and '*Conqueror of Darius*' are intersub-

stitutable, and so are 'triangle' and 'trilateral'. Furthermore, such identities can always be demonstrated by resolution . . . Suppose that A and B are terms, and that the definition of each is substituted for it, and the definitions of (resulting) parts are substituted for them, and so on until primitive, simple terms are reached; then if one comes out formally the same as the other, A and B *coincide* or are *virtually identical* . . . For changes made by substituting a definition for what is defined, or vice versa, preserve truth . . . So A coincides with B if it is possible to substitute one in place of the other *salva veritate*, or if when one analyzes each by substituting values or definitions in place of the terms the same thing (where 'same' is meant formally) results in both cases (C 362).

Part of the point of this appears to be that two terms A and B are interchangeable *salva veritate* just in case they can be resolved into one another by substitutions of a sort that preserve truth when made in sentences (e.g., by substituting definiens for definiendum, or vice versa). For any such interchange could be accomplished also by the same sequence of substitutions that carries A into B. Assuming that A and B can be resolved into one another in the way described just in case the associated concepts are identical, then this is still another indication that for Leibniz individuals of the actual world are identical if and only if their concepts are identical (cf. S 307).<sup>16</sup>

As an alternative to his definition of identity in terms of substitutivity *salva veritate* Leibniz often defines it as follows: A is the same as B if and only if A is B and B is A (C 382, S 479). We noted earlier that as Leibniz uses variables the substituends include both singular and general terms (this is, of course, syntactically easier in Latin

<sup>16</sup> The favorite example, that no two eggs are in all respects alike (cf., e.g., S 476) may be found also in Sextus Empiricus, *Adv. Math.* VII 409.

than in English). Thus he applies the just-mentioned definition not only in cases like

*Octavianus et Augustus idem est,*

but also in cases like

*Felix et pius idem est.*

In dealing with the latter sentence he plainly takes

*Pius est felix et felix est pius*

to be equivalent with

*Omnis pius est felix et omnis felix est pius.*

I am convinced that this ambiguity (if we may somewhat incorrectly call it that) in Leibniz's use of variables is partially responsible for his ambivalent attitude toward  $\ulcorner A \text{ is } A \urcorner$  as a law of logic. When  $A$  is general, this proposition has for him no existential import, amounting to  $\ulcorner \text{Whatever is } A \text{ is } A \urcorner$ . When  $A$  is singular, on the other hand, Leibniz is inclined to deny  $\ulcorner A \text{ is } A \urcorner$  if  $A$  fails to name, on the ground that what does not exist has no attributes, including, presumably, the attribute of self-identity. In setting up the formal calculus embodying Leibnizian ideas we shall let the sentence  $\beta \equiv \beta$  come out false for nondenoting  $\beta$ , but at the same time we shall make recompense by including as valid such sentences as  $\bigwedge \alpha (\alpha \equiv \beta \leftrightarrow \alpha \equiv \beta)$  and  $\bigwedge \alpha (\theta \alpha \leftrightarrow \theta \alpha)$  (cf. NE 404 ff., 'Everything is what it is . . .  $A$  is  $A$ ', S 472, C 266, C 186).

Before we leave the topic of identity it is interesting to observe in passing that Leibniz himself drew attention to the kinds of cases in which what we now call 'Leibniz's Law' fails, namely those involving oblique or referentially opaque contexts. He puts it this way:

If  $A$  is  $B$  and  $B$  is  $A$ , then  $A$  and  $B$  are called *the same*. Or,  $A$  and  $B$  are the same if they can be substituted for one another everywhere (*excepting*, however, those cases in which not the thing itself but the



manner of conceiving the thing, which may be different, is under discussion; thus Peter and the Apostle who denied Christ are the same, and the one term may be substituted for the other, unless we are considering the matter in the way some people call 'reflexive': e.g., if I say 'Peter, insofar as he was the Apostle who denied Christ, sinned', I cannot substitute 'Peter' and say 'Peter, insofar as he was Peter, sinned') (S 475).<sup>17</sup>

The analysis here offered by Leibniz is, in its essentials, very much like that of Frege, who said, "in indirect discourse we talk about the *senses* of the words", and that the sense of a word "contains the manner and context of presentation" of the designated object. Leibniz's expressions *de re* and *de modo concipiendi* also suggest the medieval distinction of modalities *de dicto* and *de re*, a distinction with which he was doubtless familiar.

Another, somewhat less clear, statement to the same effect is the following.

$A \infty B$  means that  $A$  and  $B$  are the same or may be substituted for one another everywhere (unless this is not permissible, which happens in those cases in which a term is presented for consideration in a certain respect; e.g., granted that Triangle and Trilateral are the same, still if you say 'A triangle, as such, has (an angle-sum of) 180 degrees' it is not permissible to substitute 'trilateral', since part of the content lies in that (way of saying it) (C 261)).

## 6. Relations

In a passage that is often quoted, Leibniz says:

You will not, I believe, admit an accident which is in two subjects at once. Thus I hold, as regards

<sup>17</sup> My delight in finding this passage is somewhat mitigated by the fact that, according to what I am propounding as 'standard' Leibnizian doctrine, Peter wouldn't have been Peter if he hadn't sinned.

relations, that paternity in David is one thing, and filiation in Solomon is another, but the relation common to both is a merely mental thing, of which the modifications of singulars are the foundation (G II 486).

This remark usually is taken to mean that according to Leibniz there is not, in addition to individual substances and their attributes, a third category of metaphysically fundamental entities called 'relations'. The doctrine seems to be that the truth of each true sentence of the form ' $\lceil A$  is  $B \rceil$ ', where  $A$  is a singular term and  $B$  expresses a simple attribute, depends in almost a pictorial way upon the existence of an extralinguistic complex consisting of an individual substance's 'having' that attribute (C 241), and that the truth of all other kinds of sentences is to be reduced somehow to the truth of these. In the case of negations, conjunctions, generalizations (cp. C 252), and even modalizations built up out of such materials it is not too difficult to make a plausible guess about how the reduction would be accomplished. And presumably if  $B$  expresses a complex attribute analyzable into simple attributes  $B_1, B_2, \dots, B_n, \dots$  the truth of ' $\lceil A$  is  $B \rceil$ ' would be the same as that of some combination, possibly very complicated but hopefully truth-functional, of the sentences ' $\lceil A$  is  $B_i \rceil$ '. But sentences of the form  $A\mathcal{R}B$ , with  $A$  and  $B$  singular terms and  $\mathcal{R}$  a relational expression, seem to cause particular difficulty for Leibniz. He is not content to take the trivial way out that just rereads or redescribes the sentence

David is the father of Solomon,

for example, as ascribing the attribute 'father of Solomon' to David and the attribute, 'having David as father', to Solomon; it is clear, to use some more recent terminology, that he would not be inclined to accept every open sentence with one free variable as expressing an attribute.

We know very little about how Leibniz did propose to

explicate relational sentences in terms of the sentences for which he supplied fundamental metaphysical counterparts. For a few special cases we have analyses or hints. He says that

Peter is similar to Paul

is reducible to

Peter is now *A* and Paul is now *A*,

for some *A*, and he uses this 'reduction'<sup>18</sup> to explain how the former has as a consequence the sentence

Paul is similar to Peter (C 244).

In line with the definition of identity in terms of substitutivity, the truth of an identity sentence, like

Paris = Alexander

presumably would depend upon whether all sentences of the form 'Paris is *A*', with *A* expressing a simple attribute, have the same truth values as the corresponding sentences with 'Paris' replaced by 'Alexander' (plus, as argued above, the condition that 'Paris' denotes). Further there are indications that sentences of the form

*A* is the one and only *B*

were to be analyzed as

*A* is *B* and, for every *C*, if *C* is *B* then *A* is *C* and *C* is *A*  
(C 239).

Leibniz's treatment of the sentence

Paris loves Helen

is especially significant. It shows that he contemplated

<sup>18</sup> Of course, unless the quantifier is understood as part of the analysans, no reduction has been given. By using a free variable, Leibniz leaves us guessing.

making essential use of non-truth-functional operators in his reductions. For this sentence he offers

Paris loves, and by that very fact (*eo ipso*)  
Helen is loved (C 287).

For the still more complicated case

Titius is wiser than Caius

he produces the remarkable (multiply opaque) analysis:

Titius is wise, and *qua* wise is superior insofar as  
(*quatenus*) Caius *qua* wise is inferior (C 280).<sup>19</sup>

It is difficult for a nonmetaphysician to appreciate Leibniz's motivation for these linguistic contortions, but at any rate one can see that he hoped to analyze relational sentences by means of sufficiently complex (and not in general truth-functional) combinations of the sentences he accepted as atomic.

## 7. Summary

According to the present interpretation, then, possible worlds are maximal sets of mutually compossible complete individual concepts, and a complete individual concept is a maximal set of (or a 'maximal' attribute composed of) compatible simple attributes. How two such concepts can fail to be compossible is a great mystery, according to Leibniz, but he clearly holds that there *are* infinitely many possible worlds, each of which contains infinitely many concepts. All the concepts of a given possible world are interlocked with one another; each concept belongs to exactly one possible world. Each significant singular term is associated with a complete individual concept. A sentence

<sup>19</sup> Leibniz proposes to eliminate adverbs in a similar way: 'Petrus stat pulchre = Petrus est pulcher quatenus est stans' (C 242). 'Omnis B est C' is analyzed as 'Si A est B etiam A est C' (C 252).

of the form  $\ulcorner A \text{ is } B \urcorner$ , with singular  $A$ , is true of a possible world  $W$  if and only if the individual concept associated with  $A$  belongs to  $W$  and contains the attribute expressed by  $B$  (C 85, S 474). Thus in particular, if the individual concept associated with  $A$  does not belong to  $W$ , then the sentence is false ("what does not exist has no attributes"). Even  $\ulcorner A \text{ is } A \urcorner$ , with singular  $A$ , is false of possible worlds to which the individual concept associated with  $A$  does not belong. An identity sentence  $\ulcorner A = B \urcorner$ , i.e.,  $\ulcorner A \text{ is } B \text{ and } B \text{ is } A \urcorner$ , with  $A, B$  singular, is true of a possible world if and only if the individual concepts associated with  $A$  and  $B$  are the same and belong to that possible world; otherwise it is false. A generalization is true of a possible world if and only if all of its instances, with singular terms for concepts belonging to that world, are true of that world.<sup>20</sup> And a sentence is a necessary truth if and only if it is true of all possible worlds.

## II

8. On this basis we can go some distance toward constructing a Leibnizian semantics for a system of quantified modal logic with identity and individual constants. As a first step we briefly describe a nonmodal system that in most respects is like ordinary systems of predicate logic but does not assume that every interpretation assigns a denotation to each individual constant. In this system an atomic sentence is false under a given interpretation if it contains an individual constant to which that interpretation assigns no object as denotation.

For definiteness, let the formalism be the result of adding individual constants to the formalism of TARSKI [1965]. Thus an *atomic formula* is the concatenation of a predicate of rank  $n \geq 1$  with an  $n$ -termed sequence of in-

<sup>20</sup> I thought I had textual support for this, but I can no longer find it.

dividual symbols, i.e., variables and/or individual constants; the class of *formulas* is the smallest class including the atomic formulas and containing  $\neg \phi$ ,  $(\phi \rightarrow \psi)$ , and  $\wedge \alpha \phi$  whenever it contains  $\phi$  and  $\psi$ , for any expressions  $\phi$ ,  $\psi$  and variable  $\alpha$ . A formula in which no variable occurs free is called a *sentence*. For any formula  $\phi$ , variable  $\alpha$ , and individual symbol  $\beta$ ,  $\phi\alpha/\beta$  is the result of replacing all free occurrences of  $\alpha$  in  $\phi$  by occurrences of  $\beta$ .

An *interpretation* is an ordered pair  $\langle K, \Phi \rangle$ , where  $K$  is a nonempty set and  $\Phi$  is a function that assigns to each predicate of rank  $n$  a subset of  ${}^nK$  (and to the identity predicate, in particular, the identity relation among elements of  $K$ ), and to each individual constant either *nothing at all* or an element of  $K$ .

Given an arbitrary sentence  $\phi$  and an interpretation  $\mathcal{I} = \langle K, \Phi \rangle$ ,  $\phi$  will be *true* or *false* relative to that interpretation ( $\mathcal{I}$ -true or  $\mathcal{I}$ -false). These notions are defined as follows. Let  $\psi$ ,  $\chi$  be formulas,  $\alpha$  a variable, and  $\beta$  the first (in some fixed ordering) individual constant not occurring in  $\phi$ .

(1) If  $\phi$  is atomic, then  $\phi$  is  $\mathcal{I}$ -true iff  $\phi$  assigns elements of  $K$  to all individual constants occurring in  $\phi$  and these elements (when taken in the order in which their corresponding constants occur in  $\phi$ ) are related by the relation that  $\phi$  assigns to the predicate of  $\phi$ ;

(2) If  $\phi$  is  $\neg \psi$ , then  $\phi$  is  $\mathcal{I}$ -true iff  $\psi$  is not  $\mathcal{I}$ -true;

(3) If  $\phi$  is  $(\psi \rightarrow \chi)$ , then  $\phi$  is  $\mathcal{I}$ -true iff either  $\psi$  is not  $\mathcal{I}$ -true or  $\chi$  is  $\mathcal{I}$ -true, or both;

(4) If  $\phi$  is  $\wedge \alpha \psi$ , then  $\phi$  is  $\mathcal{I}$ -true iff  $\psi\alpha/\beta$  is  $\mathcal{I}'$ -true for every  $\beta$ -variant  $\mathcal{I}'$  of  $\mathcal{I}$ .

Further,  $\phi$  is  $\mathcal{I}$ -false iff  $\phi$  is not  $\mathcal{I}$ -true.

(Where  $\beta$  is any individual constant, an interpretation  $\mathcal{I}'$  is a  $\beta$ -variant of  $\mathcal{I}$  iff  $\mathcal{I}'$  makes an assignment to  $\beta$  and  $\mathcal{I}$  and  $\mathcal{I}'$  are the same or differ at most in not assigning the same thing to  $\beta$ . Note that 'is a  $\beta$ -variant of' is not symmetrical.)

A sentence  $\phi$  is *universally valid* if  $\phi$  is  $\mathcal{J}$ -true for every interpretation  $\mathcal{J}$ .

Complete sets of axioms for the universally valid sentences of this system are not hard to find. One such set may be obtained by making relatively minor modifications in the elegant set for the system  $\Sigma_5$  of KALISH and MONTAGUE [1965] (cf. TARSKI [1965]) for ordinary predicate logic with identity. Namely, for all formulas  $\phi, \psi, \chi$ , variables  $\alpha$ , and individual symbols  $\beta, \gamma$  we take all universal closures of the following as axioms:

- (1)  $(\phi \rightarrow \psi) \rightarrow ((\psi \rightarrow \chi) \rightarrow (\phi \rightarrow \chi))$ ;
- (2)  $(\neg \phi \rightarrow \phi) \rightarrow \phi$ ;
- (3)  $\phi \rightarrow (\neg \phi \rightarrow \psi)$ ;
- (4)  $\bigwedge \alpha (\phi \rightarrow \psi) \rightarrow (\bigwedge \alpha \phi \rightarrow \bigwedge \alpha \psi)$ ;
- (5)  $\phi \rightarrow \bigwedge \alpha \phi$ , where  $\alpha$  does not occur free in  $\phi$ ;
- (6)  $\neg \bigwedge \alpha \neg \alpha \equiv \beta$ , where  $\beta$  is a variable;

(7)  $\beta \equiv \gamma \rightarrow (\phi \rightarrow \psi)$ , where  $\phi, \psi$  are atomic and  $\psi$  is like  $\phi$  except for containing an occurrence of  $\gamma$  where  $\phi$  contains an occurrence of  $\beta$ ;

(8)  $\phi \rightarrow \neg \bigwedge \alpha \neg \alpha \equiv \beta$ , where  $\phi$  is atomic and  $\beta$  is an individual constant occurring in  $\phi$ .

The single rule of inference is *modus ponens*.

The essential differences between this set and the set for the system  $\Sigma_5$  are the addition of axiom-schema (8) and the restriction of the axioms (6) to those cases in which  $\beta$  is a variable. If ' $\neg \bigwedge \alpha \neg \alpha \equiv \beta$ ' is read ' $\beta$  exists', it will be seen that the former of these changes reflects the Leibnizian principle that "what does not exist has no properties" and that the latter expresses our decision not to presuppose that every individual constant denotes.

Completeness may be proved along the lines of Henkin's proof, as formulated e.g. in MATES [1965]. Relative to that formulation the principal change is that  $\omega$ -completeness must be redefined in such a way that a set of sentences  $\Gamma$  is  $\omega$ -complete iff, for every formula  $\phi$  and variable  $\alpha$ , if  $\neg \bigwedge \alpha \neg \phi$  belongs to  $\Gamma$  then there is an individual constant  $\beta$  such that  $\phi\alpha/\beta$  and  $\beta \equiv \beta$  belong to  $\Gamma$ . This leads to the result that, if  $\Gamma$  is maximal d-consistent and  $\omega$ -

complete, then  $\wedge \alpha \phi \in \Gamma$  iff  $\phi \alpha / \beta \in \Gamma$  for every individual constant  $\beta$  such that  $\beta \equiv \beta \in \Gamma$ .

Comparison of the foregoing axioms with the axioms for the Kalish-Montague system  $\Sigma_5$  shows that (i) every individual-constant-free theorem of ordinary predicate logic with identity is a theorem of the present system, and (ii) every theorem of this system is a theorem of ordinary predicate logic with identity. From the semantic characterization of the theorems it is evident that the rule of substitution for predicates does not hold; for example

$$Fa \rightarrow \neg \wedge x \neg Fx$$

is a theorem, but

$$\neg Fa \rightarrow \neg \wedge x \neg \neg Fx$$

is not. Intuitively, if the individual  $a$  has the property  $F$ , then something has  $F$ , but if it is not the case that the individual  $a$  has  $F$ , the reason might be that  $a$  does not exist at all.

9. One could construct a more-or-less Leibnizian system of predicate logic by adding modal operators to the foregoing revised quantification theory, in the manner suggested in KRIPKE [1963, 2], p. 89n. But in order to stay somewhat closer to the Leibnizian framework we shall formulate our semantics in terms of attributes and concepts, abandoning (partially) the relatively secure basis of sets.

For this second system the formalism will be the same as for the system described above, except that (i) a necessity-symbol  $\Box$  is added, and (ii) all predicates other than the identity predicate are of rank 1.

A *complete individual concept* is a set of simple properties satisfiable by exactly one thing and containing all the simple properties that would belong to that one thing if it existed. The set of all complete individual concepts and the set of all simple properties are denumerably infinite.



*Compossibility* is an equivalence relation in the former set, partitioning it into equivalence classes, called *possible worlds*. There are denumerably infinitely many possible worlds, each containing infinitely many concepts. The non-logical constants of our language are interpreted, once and for all, as follows: (i) the set of individual constants is mapped onto the set of complete individual concepts; (ii) the set of singular predicates is mapped onto the set of simple properties. (If  $\beta$  is an individual constant, let  $C(\beta)$  be the complete individual concept associated with  $\beta$ ; if  $\theta$  is a singular predicate, let  $C(\theta)$  be the simple property associated with  $\theta$ .)

We define the relation *true of*, for any sentence  $\phi$  and possible world  $W$ , as follows. Let  $\psi$ ,  $\chi$  be formulas,  $\alpha$  a variable,  $\beta$ ,  $\gamma$  individual constants,  $\theta$  a predicate other than the identity predicate.

(1) If  $\phi$  is  $\theta\beta$ , then  $\phi$  is true of  $W$  iff  $C(\theta) \epsilon C(\beta)$  and  $C(\beta) \epsilon W$ ;

(2) If  $\phi$  is  $\beta \equiv \gamma$ , then  $\phi$  is true of  $W$  iff  $C(\beta) = C(\gamma)$  and  $C(\beta) \epsilon W$ ;

(3) If  $\phi$  is  $\neg \psi$ , then  $\phi$  is true of  $W$  iff  $\psi$  is not true of  $W$ ;

(4) If  $\phi$  is  $(\psi \rightarrow \chi)$ , then  $\phi$  is true of  $W$  iff either  $\psi$  is not true of  $W$  or  $\chi$  is true of  $W$ , or both;

(5) If  $\phi$  is  $\bigwedge \alpha \psi$ , then  $\phi$  is true of  $W$  iff  $\psi\alpha/\beta$  is true of  $W$  for every individual constant  $\beta$  such that  $C(\beta) \epsilon W$ ;

(6) If  $\phi$  is  $\Box \psi$ , then  $\phi$  is true of  $W$  iff  $\psi$  is true of every possible world  $W'$ .

A sentence  $\phi$  is a *necessary truth* iff  $\phi$  is true of all possible worlds.

Due to the open-endedness and perhaps the vagueness of the foregoing semantics, there can be no question of constructing a complete set of axioms for the system. For example, nothing that has been said would determine in a particular case whether  $\phi \rightarrow \psi$ , with  $\phi$ ,  $\psi$  atomic sentences,

was a necessary truth or not.<sup>21</sup> We *are* able, however, to characterize certain large classes of necessary truths syntactically and to provide counterexamples for various principles (e.g., for the so-called 'Barcan formula'—MARCUS [1946]—and its converse) that have sometimes been proposed as laws of modal quantification theory. Note that such counterexamples can always be made 'intuitive'—relative to Leibniz's philosophical outlook, at least—via the definition of 'true of' given above.<sup>22</sup>

#### A. Some classes of necessary truths.

(1) All the universally valid sentences of the earlier system that are sentences of the Leibnizian system are necessary truths; and in fact all sentences derivable by *modus ponens* from sentences of types (1)–(8), with  $\phi$ ,  $\psi$ ,  $\chi$  now taken as arbitrary formulas of the Leibnizian system, are necessary truths.

(2) For any formulas  $\phi$ ,  $\psi$ : all universal closures of (i)  $\Box\phi \rightarrow \phi$ , (ii)  $\Box(\phi \rightarrow \psi) \rightarrow (\Box\phi \rightarrow \Box\psi)$ , and (iii)  $\neg \Box\phi \rightarrow \Box\neg \Box\phi$  are necessary truths, and if  $\phi$  is a necessary truth, so is  $\Box\phi$ . Therefore, the Leibnizian system includes the Lewis system S5, cf. PRIOR [1962] p. 312.

(3) All theorems of the 'quantified M' system of KRIPKE [1963, 2] are necessary truths.

(4) For any formulas  $\phi$ ,  $\psi$  and individual constants  $\beta$ ,  $\gamma$ : all universal closures of  $\beta \equiv \gamma \rightarrow \Box(\phi \rightarrow \psi)$  are necessary truths, where  $\psi$  is like  $\phi$  except for having occurrences of  $\gamma$  at one or more places where  $\phi$  has occurrences of  $\beta$ .<sup>23</sup>

(5) For any individual constants  $\beta$ ,  $\gamma$  and possible

<sup>21</sup> Thus, for each individual constant  $\beta$  there are infinitely many predicates  $\theta$  such that  $\beta \equiv \beta \rightarrow \theta\beta$  is a necessary truth (cf. NE 309) and infinitely many for which it is not a necessary truth.

<sup>22</sup> As Mrs. MARCUS (MARCUS [1963]) has said, "... the polemics of modal logic are perhaps best carried out in terms of some explicit semantical construction".

<sup>23</sup> It seems that paradoxes like the one about '(9 > 7)' can best be handled in this sort of system (expanded to include non-logical predicates of rank greater than 1) by adding a Russellian theory of descriptions with scope always taken as innermost.

world  $W$ :  $\beta \equiv \gamma$  is true of  $W$  iff  $\neg \wedge \alpha \neg \alpha \equiv \beta$  is true of  $W$  and all sentences  $(\theta\beta \leftrightarrow \theta\gamma)$  are true of  $W$  for all singular predicates  $\theta$ .

(6) Where  $\Diamond$ ,  $\neq$ ,  $\&$ , and  $\leftrightarrow$  are defined in the usual manner:

- (i) For every individual constant  $\beta$ ,  $\Diamond \beta \equiv \beta$  is a necessary truth.
- (ii) For every pair of individual constants  $\beta, \gamma$ ,  
 $\Diamond (\beta \equiv \beta \& \gamma \equiv \gamma) \rightarrow \Box (\beta \equiv \beta \leftrightarrow \gamma \equiv \gamma)$  is a necessary truth.
- (iii) For any individual constants  $\beta_1, \dots, \beta_n$   
 $\Diamond (\beta_1 \neq \beta_1 \& \beta_2 \neq \beta_2 \& \dots \& \beta_n \neq \beta_n)$  is a necessary truth.
- (iv) For any variables  $\alpha_1, \dots, \alpha_n$ ,  
 $\Diamond \alpha_1 \dots \alpha_n (\alpha_1 \neq \alpha_2 \& \dots \& \alpha_1 \neq \alpha_n \& \dots \& \alpha_{n-1} \neq \alpha_n)$  is a necessary truth.

## B. Counterexamples, etc.

(1) Specification, of course, does not hold; e.g.,  $\wedge \alpha \theta \alpha \rightarrow \theta \beta$  is not in general a necessary truth, for variable  $\alpha$ , individual constant  $\beta$ , and singular predicate  $\theta$ .

(2) Generalization on individual constants does not hold; i.e., it is *not* the case that for every formula  $\phi$ , variable  $\alpha$ , and individual constant  $\beta$ , if  $\phi\alpha/\beta$  is a necessary truth and  $\beta$  does not occur in  $\phi$ , then  $\wedge \alpha \phi$  is a necessary truth. Counterexample: let individual constants  $\beta, \beta'$  and possible worlds  $W, W'$ , be such that  $C(\beta) \in W, C(\beta') \in W', W \neq W'$ . Then  $\Diamond (\beta \neq \beta \& \beta' \equiv \beta')$  is a necessary truth, but  $\wedge \alpha \Diamond (\beta \neq \beta \& \alpha \equiv \alpha)$  is not, since it is not true of  $W$ . Thus

Adam doesn't exist but Pegasus does

is true of a possible world, and so

$\Diamond$  (Adam doesn't exist but Pegasus does)

is true of the actual and all other possible worlds, i.e., is a necessary truth. But

$\wedge x \diamond (\text{Adam doesn't exist but } x \text{ does})$

is false of the actual world because Adam is one of the values of the variable; thus the specific case is a necessary truth but the generalization is not.

(3) The so-called Barcan formulas  $\wedge \alpha \Box \phi \rightarrow \Box \wedge \alpha \phi$  are not in general necessary truths. If  $C(\beta) \in W$ , then  $\wedge \alpha \Box (\alpha \equiv \alpha \leftrightarrow \beta \equiv \beta)$  is true of  $W$ , but  $\Box \wedge \alpha (\alpha \equiv \alpha \leftrightarrow \beta \equiv \beta)$  is not true of any  $W$ . E.g., it is true of the actual world that every object in it exists in those and only those possible worlds in which Adam exists, but it is not true of the actual world that in every possible world all the objects exist if and only if Adam exists. The converses of the Barcan formulas fail, too:  $\Box \wedge \alpha \alpha \equiv \alpha$  is a necessary truth but  $\wedge \alpha \Box \alpha \equiv \alpha$  is not; i.e., in each possible world everything is self-identical, but nothing in the actual world is self-identical in any other world, since it does not even exist in any other world. There is in general no commutativity of quantifiers with modal operators.

(4)  $\beta \equiv \gamma \rightarrow \Box \beta \equiv \gamma$ , for individual constants  $\beta$ ,  $\gamma$  is not a necessary truth, nor are its generalizations.

Although, as mentioned above, there can be no question of axiomatizing the set of necessary truths (since 'necessary truth' has not been defined exclusively in terms of the logical form of the expressions concerned), we could introduce a set of 'formally necessary truths' or 'truths that are necessary by virtue of their form' and ask whether axioms can be found for that totality. One could say, for example, that  $\phi$  is a *formally* necessary truth if and only if  $\phi$  is a necessary truth and every result of replacing distinct nonlogical constants in  $\phi$  by distinct nonlogical constants is again a necessary truth. I do not know how or even whether axioms can be found for this subset, but clearly the sentences 6 (i)–(iv) above (which seem collectively to express the crucial facts that every individual concept belongs to some possible world, no individual concept belongs to more than one possible world, there are infinitely many possible worlds, and each possible

world contains infinitely many individual concepts) are among the promising candidates.<sup>24</sup>

### References

Abbreviations are indicated in parentheses. I have included in this bibliography various items which are not explicitly cited in my text but which constitute an important part of the literature of the subject under discussion.

- Carnap, R., Modalities and quantification, *Journal of Symbolic Logic* 11 (1946) pp. 33-64.
- Couturat, Louis, *La logique de Leibniz d'après des documents inédits* (Paris 1901).
- (C) Opuscles et fragments inédits de Leibniz (Paris 1903).
- Dürr, K., *Neue Beleuchtung einer Theorie von Leibniz* (Darmstadt 1930).
- (E) Erdmann, J. D., G. G. *Leibnitii Opera Philosophica* (Berlin 1840).
- (G) Gerhardt, C. I., *Die philosophischen Schriften von G. W. Leibniz*, I-VII (Berlin 1875-90).
- Hintikka, J., Existential presuppositions and existential commitments, *The Journal of Philosophy* 56 (1959) pp. 125-37.
- Modality and quantification, *Theoria* 27 (1961) pp. 119-28.
- Studies in the logic of existence and necessity, *The Monist* 50 (1966) pp. 55-76.
- Kalish, D., and R. Montague, On Tarski's formalization of predicate logic with identity, *Archiv für mathematische Logik und Grundlagenforschung* 7 (1965) pp. 81-101.
- Kanger, S., The Morning Star paradox, *Theoria* 23 (1957) pp. 1-11.
- (K) Kauppi, R., *Über die Leibnizsche Logik* (Helsinki 1960).
- Einige Bemerkungen zum Principium Identitatis Indiscernibilium bei Leibniz, *Zeitschrift für philosophische Forschung* 11 (1966) pp. 497-506.
- Kneale, W. and M. Kneale, *The Development of Logic* (Oxford 1962).

<sup>24</sup> Research for this paper was supported by National Science Foundation Grant No. GS-180.

- Kripke, S. A., Semantical analysis of modal logic I, *Zeitschrift für mathematische Logik und Grundlagen der Mathematik* 9 (1963) pp. 67-96. \*
- Semantical considerations on modal logic, *Acta Philosophica Fennica* 16 (1963) pp. 83-94.
- Leblanc, H., and T. Hailperin, Nondesignating singular terms, *The Philosophical Review* 68 (1959) pp. 239-43.
- (NE) Leibniz, G. W., *New Essays*, tr. A. G. Langley, Chicago, 1916.
- (T) *Theodicy*, tr. E. M. Huggard, New Haven, 1952.
- Marcus, (Mrs.) Ruth Barcan, A functional calculus of first order based on strict implication, *The Journal of Symbolic Logic* 11 (1946) pp. 1-16.
- Modal Logics I: Modalities and Intensional Languages, *Boston Studies in the Philosophy of Science* (Dordrecht, Holland 1963) pp. 77-96.
- Montague, R., Logical necessity, physical necessity, ethics, and quantifiers, *Inquiry* 4 (1960) pp. 259-68.
- Syntactical treatments of modality, with corollaries on reflexion principles and finite axiomatizability, *Acta Philosophica Fennica* 16 (1963) pp. 153-67.
- Parkinson, G. H. R., *Leibniz: Logical Papers* (Oxford 1966).
- Logic and reality in Leibniz's metaphysics* (Oxford 1965).
- Prior, A. N., *Formal Logic* (second edition, Oxford 1962).
- Quine, W. V. O., Comments (see MARCUS [1963]), *Boston Studies in the Philosophy of Science* (Dordrecht, Holland 1963) pp. 97-104.
- From a logical point of view* (Cambridge, Mass., 1961).
- Three grades of modal involvement, *Proceedings of the XIth International Congress of Philosophy* (Amsterdam 1953) Vol. XIV, pp. 65-81.
- Word and Object* (New York 1960).
- Rescher, N., *The philosophy of Leibniz* (Englewood Cliffs, New Jersey 1967).
- (R) Russell, B. A. W., *A critical exposition of the philosophy of Leibniz* (London 1900).
- (S) Schmidt, F., *Gottfried Wilhelm Leibniz: Fragmente zur Logik* (Berlin 1960).
- Tarski, A., A simplified formalization of predicate logic with identity, *Archiv für mathematische Logik und Grundlagenforschung* 7 (1965) pp. 61-79.

## RECENT WORK ON THE PHILOSOPHY OF LEIBNIZ<sup>1</sup>

BERTRAND RUSSELL

The philosophy of Leibniz, his merits and demerits, and his place in the history of thought, have been hitherto universally and completely misunderstood. This is to be accounted for partly by his sheer intellectual greatness, partly by the ignorance of editors, partly by his lack of leisure to compose a *magnum opus*, and partly also (it must be confessed) by his utter lack of moral elevation. This last cause led him to publish by preference his worst writings, to ruin the consistency of his system for the sake of orthodoxy, and to mislead the world (after his unsuccessful experiment with Arnauld) as to the grounds of his metaphysical tenets. Among the papers which he left unpublished, there is contained much that has a far higher value than any philosophical treatise that he permitted the world to see. But here the editors become to blame. M. Couturat shows that a whole mine of the most valuable material has been left untouched by Erdmann and Gerhardt, and that many opinions and methods, which

From *Mind* XII (1903), copyright © 1971 Bertrand Russell. Reprinted by permission of the editor of *Mind*.

<sup>1</sup>*La Logique de Leibniz d'après des documents inédits*. Par Louis Couturat, chargé de cours à l'université de Toulouse. Paris: Alcan, 1901. Pp. xiv., 608. *Leibniz' system in seinen wissenschaftlichen Grundlagen*, von Dr. E. Cassirer. Marburg: N. G. Elwert'sche Verlagsbuchhandlung, 1902. Pp. xiv., 548.

had been known only in isolated fragments, belong really to systematic and life-long attacks on fundamental problems. No man more often or more gloriously than Leibniz missed a unit by aiming at a million. And if he failed to compose a *magnum opus*, M. Couturat shows that this was due to the vastness of the enterprise that he undertook—an enterprise surpassing the powers of a single man, but never assisted, in spite of urgent appeals, by any of his contemporaries. His philosophical successors, too, have smiled at his projects, until at last the mathematicians, if not completely, yet in a very large measure, have unwittingly realised them.

For the true understanding of Leibniz, M. Couturat's work is of the very first importance. It is based upon an extensive study of unpublished manuscripts, to which was brought, what is absolutely essential, a wide and thorough knowledge of modern mathematics—Symbolic Logic, Arithmetic and Geometry. Without such knowledge, it is impossible to appreciate the merit of attempts which have not succeeded, to know why they failed, or to realise that success was possible and of the highest moment. Three objects are served by M. Couturat's work. The first, which he mentions as the chief, is to show that "Leibniz's metaphysic rests solely upon the principles of his Logic, and proceeds entirely from them" (p. x.). The second is to set forth precisely what his Logic was, and the third is to show its connexion with the various projects of a universal characteristic, a universal language, a universal mathematics, etc., which Leibniz cherished throughout his life. In all three objects, as it seems to me, although some of the principal conclusions absolutely contradict received opinions, the work is completely successful. Perhaps the most revolutionary conclusion in the whole book is, that the principle of reason, for all its trappings of teleology and Divine goodness, means no more than that, in every true proposition, the predicate is contained in the subject, i.e., that all truths are analytic (p. x.). In face of the evi-



dence adduced, this conclusion, startling as it is, appears to be quite irrefutable.<sup>2</sup>

The work is divided into nine chapters, dealing respectively with Syllogistic, the *Ars Combinatoria*, the Universal Language, the Universal Characteristic, the Encyclopædia, the *Scientia Generalis*, the Universal Mathematics, the Logical Calculus, and the Geometrical Calculus. All these projects are shown to be interconnected, and to spring from a common logical root. Some have been proved by time to be chimerical, while others—notably the three last—are now actually constituted, two of them very much as Leibniz endeavoured to constitute them. The common logical source of his doctrines consists, as M. Couturat points out, of two postulates: (1) All ideas are compounded of a very small number of simple ones, forming the *Alphabet of human thoughts*; (2) complex ideas proceed from these simple ones by a uniform and symmetrical method of combination analogous to arithmetical multiplication (p. 431). Both these postulates are of course false; but while in some regions their falsity is disastrous, in others it is only unfortunate. Two other errors, less fundamental, but perpetually recurring, are pointed out by M. Couturat, and are attributed by him (p. 438) to an almost unconscious respect for Aristotle. The first of these, which was only a defect of method, consisted in a preference for taking syllogisms in intension rather than extension; the second, which rendered Leibniz's attempts to found the logical calculus abortive, was the failure to realise the fallacy in such moods as *Darapti* and in the scholastic doctrine of conversion and subalternation, which results from wrongly assigning existential import to universal terms (pp. 32, 348ff.). These errors are already set forth in the first chapter, together with certain technical improvements which Leibniz suggested in the treatment of syllogisms.

<sup>2</sup> In my *Philosophy of Leibniz*, chap. iii., I gave a different interpretation, which M. Couturat's work has persuaded me to abandon.

The second chapter deals with the *De Arte Combinatoria*, which Leibniz published at the age of twenty. The art suggested consists in analysing all concepts by reducing them to simpler concepts, until at last we reach certain simple indefinable concepts: these will be the terms of the first order. Every composite term will then be represented by the symbolic product of its constituent simple terms, which will constitute its definition. The predicates of a term are its factors, and the subjects of which it can be affirmed are its multiples. Here already, as M. Couturat remarks (pp. 48-49), we find Leibniz's leading ideas.

The third chapter points out that the characteristic was at first conceived by Leibniz as a universal language, not as an Algebra. This language was to be simple, because it was to be based on a logical foundation, *i.e.*, on a complete analysis of concepts: for every simple concept there was to be a symbol. When he first hoped for an Algebra of thought, he identified this with his universal language. This was his view in 1676; but four years later he distinguishes his language from every kind of Calculus (pp. 61, 78). He had a device by which the syllables of a word could be permuted without change of meaning; this, he says (p. 63), would give great facility for verse or music, enabling very beautiful songs and poems to be composed by an infallible and quasi-demonstrative method! For the purpose of his universal language, he undertook a grammatical analysis. He rightly decided that inflexions are to be avoided as far as possible, and that the philosophic language should be analytic. Nouns, he says, express ideas, while verbs express propositions, and particles (though this is not so clearly said) express relations (pp. 69, 71, 72). Besides adjectives and particles, he says, we require only one noun, *ens*, and one verb, *est*. He has great difficulty in the treatment of the genitive, and in other forms involving relations not reducible to predication. In all his grammatical analysis, he has a logical purpose, namely the justification of the asylogistic inferences which he had learnt to study from Jungius. Two types of

these occupied him, namely the inversion of relations (David was the father of Solomon, therefore Solomon was the son of David), and inferences from the direct to the oblique, such as: A horse is an animal, therefore the head of a horse is the head of an animal (this is not Leibniz's instance, but, I think, Jevons's). His grammatical analysis, as M. Couturat remarks (p. 437), gave him the materials for a logic of relations; but out of respect for scholastic tradition, he regarded these materials as *merely* grammatical, and made no logical use of them. Thus he was unable to symbolise the above two types of inference, of which, we may observe, the true statement is the following: (1) If  $x$  has to  $y$  the relation  $R$ ,  $y$  has to  $x$  the converse relation; (2) if all  $a$  is  $b$ , every term having the relation  $R$  to an  $a$  has this relation to a  $b$ . Leibniz's grammatical studies suggest the reflexion, recommended also by many more general considerations, that philosophical theories of Logic have far too much neglected grammar, and that the endeavour to represent actual sentences in accordance with received doctrine would long ago have revealed the importance of many neglected points. Leibniz appears to me to be right in holding that the verb conceals the inmost essence of the proposition, and even of truth itself; but the necessity for particles in his language ought to have shown him the falsity of the subject-predicate logic. Philosophical grammar appears to be a subject of the highest importance; but, like all other subjects, it has been most shamefully neglected.

The construction of a universal language, we saw, was to be based upon the "Alphabet of human thoughts"; but this required an analysis of all concepts and an inventory of human knowledge. The latter was to be the Encyclopædia; the former would give the materials for the universal characteristic. These two projects thus developed out of the attempt to construct a truly philosophic language (p. 79); and neither could be carried far without the other, since the characteristic requires the reduction of all scientific notions to a logical system, which is the

work of the *Encyclopædia*, while this in turn presupposes a determination of the order of scientific truths, which depends upon the characteristic. For this reason, both must be developed and perfected together (p. 80).

Chapter iv. explains what the characteristic was to be. It was to consist of a collection of signs which not merely represented ideas, but were to be positive aids to reasoning, like the symbols of Arithmetic and Algebra. Indeed, the characteristic was actually to replace the necessity of reasoning by rules for the manipulation of signs (p. 101). Leibniz attached so much importance to the invention of proper symbols that he attributed to this alone the whole of his discoveries in mathematics (pp. 83–84). In this high estimate of symbolism, those who have profited by modern Symbolic Logic will be inclined to agree with him; while the bulk of the learned world will probably continue to agree with Tschirnhaus, who wrote that he saw no utility in the invention of the Infinitesimal Calculus, and that the introduction of new notations made the sciences difficult (p. 86). The Characteristic was to apply to all strict reasoning, and was to be especially useful in philosophy, where (as Leibniz most justly observes) rigour is more essential than in geometry, because errors are less easily detected (p. 93n.). Leibniz allowed several parallel symbolisms for his logic—arithmetical, algebraical, geometrical, and even mechanical—for all rational sciences must “symbolise” with each other (p. 116). This rather difficult expression means, I fancy, that, by giving different meanings to the symbols, a given symbolic proposition may be interpreted as a true proposition in any one of these sciences—a procedure of which there are innumerable instances in mathematics.

The most ambitious and the most chimerical of Leibniz's schemes was the *Encyclopædia*. This was to contain the whole body of human knowledge, historical and scientific, arranged in a logical order, and following a demonstrative method. It was to begin with simple and primitive terms, and Euclid's *Elements* were to be its model;

finally, a small number of principles would suffice for the foundation, and thus the sciences would be abridged as they grew (p. 152). This task, even Leibniz had to admit, surpassed the powers of a single man, and for its fulfilment he wished to found an "Imperial German Society"; all his plans for the foundation of Academies are connected with the Encyclopædia (p. 127 and Appendix iv). Originally, theology and law occupied the place of honour in the Encyclopædia; but after 1679 logic was to be immediately succeeded by mathematics and physics (p. 129). Two causes, we are told (p. 175), prevented the accomplishment of the work—the lack of time, and the failure to find collaborators. Surely we may add the inherent impossibility of the task; for here Leibniz's panlogism, his belief in the possibility of deducing everything *a priori* from a small number of premisses, led him to conceive all truth as an ordered chain of deduction in a sense which is essentially false. In Pure Mathematics, where alone this ideal is applicable, the task which he attempted has been at last accomplished; but elsewhere, premisses which are essentially empirical—i.e., concerned with existence at particular times—appear to be logically and ultimately essential.

The Encyclopædia required what Leibniz called *Scientia Generalis*, i.e., a general method applicable to all the sciences; this was, in fact, the whole of his Logic (p. 176). M. Couturat studies it fully in a long chapter (chap. vi.).

Leibniz makes two divisions in the art of reasoning. We may reason, he says, from principles to consequences, from causes to effects; or again, we may go from given consequences to the principles required, from known effects to unknown causes (p. 177). The other division is into the logic of certainties and the logic of probabilities (p. 239). Both these divisions seem objectionable. If a principle can be inferred from a consequence, it must follow from the consequence, and is therefore a consequence of the consequence. As for causes and effects, it is of course pos-

sible, speaking generally, to argue either from effects to causes or from causes to effects, and this seemed relevant to Leibniz because he regarded causes as *logically* prior to effects (p. 222). But when it is recognised that cause and effect are on the same logical level, this twofold direction of temporal implications ceases to have a fundamental logical importance. As for probability, it is, Leibniz says, the logic of the real; if we could calculate the probability of all the events that are possible in a certain contingency, the one which is most probable would certainly happen (p. 239). This view seems to rest upon a false theory of probability, but I cannot discover precisely what theory, or whether any definite theory at all. It seems certain, however, that the most probable of a number of events is never certain unless all the others are impossible. The whole theory of probability appears to belong to a world apart, having nowhere any contact with the world of certainty; and this is fortunate, for the logical analysis of probability, so far as I have been able to discover, is as yet wholly unaccomplished.

Leaving this twofold division, let us examine the rest of Leibniz's general science. The analysis either of ideas or of truths, he says, may be infinite; but the foundation of all truths is the same, namely that the predicate is contained in the subject (pp. 184, 208ff.). Consequently there are no indemonstrable axioms except the law of identity or contradiction, though for the present it is necessary to accept some axioms without proof. Axioms are proved *by means* of definitions, but their truth rests on the law of identity, not on definitions. Definitions are not arbitrary, as Hobbes maintained, for their objects must be shown to be *possible*, i.e., not contradictory. The best way of proving this is to analyse a notion completely, for all simple notions are compatible *inter se*. Here Leibniz was faced by an insuperable difficulty, which was one great source of error in his philosophy. We saw that he believed all synthesis of simple concepts into complex ones to be of a single type, the type which is now called logical mul-

tiplication. Hence he was unable to explain how simple ideas, all compatible *inter se*, could generate incompatible complexes (p. 432). He remarks himself (*Gerh.* vii., 195): "It is yet unknown to men what is the reason of the impossibility of different things, or how it is that different essences can be opposed to each other, seeing that all purely positive terms seem to be compatible". The fact is, that the notion "*not-a*" is formed by a synthesis of quite a different kind from logical multiplication: there is not a class of *nots* and a class of *a's* whose common part is "*not-a*". Thus incompatibility is only explicable by admitting a synthesis which is not that of two predicates, such as the analytic theory of judgment requires; and yet, until we have such negative predicates as "*not-a*," there is no possibility of contradiction, and therefore no field for the application of the analytic criterion of truth. And when this one new form of synthesis has been admitted, it becomes easy to see that there are others, of which the chief are logical addition and relative multiplication.<sup>3</sup> Thus a more careful consideration of negative terms and of the conditions of incompatibility would have sufficed to show Leibniz the falsity of the analytic theory of truth and of the whole subject-predicate logic.

That Leibniz held *all* truths, not only the necessary ones, to be analytic, is proved by many passages which M. Couturat quotes (see p. 208ff.). This principle, that the predicate is always contained in the subject, is held to be the foundation of Leibniz's metaphysic (p. 209n.)—a thesis which is amply demonstrated in a separate article.<sup>4</sup> Every truth is either formally or virtually identical, and consequently has its *a priori* proof; but in the case of truths of fact, this proof requires an infinite analysis,

<sup>3</sup> Relative multiplication is the kind of synthesis which, from two relations of father to son, obtains a relation of grandfather to grandson.

<sup>4</sup> "Sur la métaphysique de Leibniz (avec un opuscule inédit)," *Revue de Métaphysique et de Morale*, January, 1902. I shall refer to this article in future as RMM.

which God alone can accomplish. Contingent truths, as Leibniz is fond of remarking, resemble incommensurables; the exact point of resemblance is that both involve an infinite series. The view that propositions which are analytic may not be necessary is strangely paradoxical, and brings out with startling clearness the hopeless inconsequence involved in Leibniz's doctrine of contingency, with its tiresome progeny of final causes, liberty, and optimism. Nevertheless the following passage, quoted by M. Couturat from an unpublished MS. (RMM, p. 11n.), leaves it beyond doubt that the above was really his view: *Ita arcanum aliquod a me evolutum puto, quod me diu perplexum habuit, non intelligentem, quomodo praedicatum subjecto inesse posset, nec tamen propositio fieret necessaria. Sed cognitio rerum geometricarum atque analysis infinitorum hanc mihi lucem accendere, ut intelligerem, etiam notiones in infinitum resolubiles esse.*<sup>5</sup> The view which Leibniz held in youth, namely that the number of simple concepts is finite, and that there is only one kind of synthesis of concepts, involves the consequence that the total number of concepts is finite. For, owing to the law of tautology, nothing is gained by the repetition of a concept in a complex in which it already occurs; hence if  $n$  be the number of simple concepts,  $2^n - 1$  will be the total number of concepts, both simple and complex. This consideration alone should have led Leibniz to reflect

<sup>5</sup> The view that infinite complexity is the defining property of the contingent has the curious consequence that truths about possible substances are contingent. For any substance that might have existed in a possible world (since all possible worlds involve time) would have had the same infinite complexity as actual substances have. I imagine Leibniz would have replied that individual substances—as opposed to generic and specific notions—are known to us only by experience, which requires actual existence; what we can know *a priori* never has infinite complexity, and hence we cannot have the notion of any one particular possible substance in a possible world, unless this substance actually exists. The infinite complexity required for particularising a substance exists confusedly in perception, but does not exist at all in our knowledge of possible non-existent substances.



either that there is more than one kind of synthesis, or that the number of simple concepts is infinite. One or other of these (both of which are true) is involved in the possibility of infinite complexity. I do not know whether Leibniz perceived this, nor, if he did, which of the two he adopted. It is certain that the doctrine of the infinite complexity of contingents belongs to his mature philosophy rather than to his earlier attempts; and M. Couturat's chapter on the Logical Calculus seems to show that his views on the kinds of synthesis did not change sufficiently to allow of infinite complexity resulting from a finite number of concepts. If, then, Leibniz perceived this difficulty at all, he must have abandoned the view—which seems to have been rather an unconscious prejudice than a definite opinion—that the number of simple concepts is finite.

The principle that all truths are analytic is Leibniz's "principle of reason". This principle is first stated in 1670, in the "*Theoria Motus Abstracti*"; it is not, M. Couturat says, a consequence of the law of contradiction, but its complement, for while the one affirms that every identical proposition is true, the other affirms that every true proposition is analytic, *i.e.*, virtually identical (pp. 214–15). The mutual independence of these two principles—which seems to be true in fact, and is suggested, though not explicitly stated, in Leibniz's language—has a very curious consequence, not pointed out by M. Couturat. If the principle of reason does not follow from the law of contradiction, it cannot, according to Leibniz's logic, be itself analytic, and is therefore an instance of its own falsity. This proves that, unless we can deduce from the law of contradiction itself that all truths are analytic, there must be at least one truth which is synthetic. The principle of reason, therefore, is either false or a mere consequence of the law of contradiction—an alternative which we can have no hesitation in deciding.<sup>6</sup>

<sup>6</sup> M. Couturat tells me that he regards as analytic every proposition which follows from the principles of logic, of which the

Leibniz speaks sometimes as though the principle of reason were only applicable to contingents. This, M. Couturat rightly remarks, is due to the fact that elsewhere, though applicable, it is not required for demonstration (p. 216). Its universality results from Leibniz's dictum: "We may say, in some sort, that these two principles are contained in the definition of the true and the false" (p. 217). The contingency of all temporal existents results from the definition by infinite complexity through the principle that the cause is the ground of the effect, whence an infinite analysis is required for the *a priori* proof of temporal propositions (p. 222). The use of the principle of reason in deducing the nature of what actually exists is interesting, but very confused. M. Couturat proves from an unpublished MS. that already in December 1676 Leibniz held that not all possibles exist (p. 219n.)—a fact which, as is justly observed (RMM, p. 12n.), suffices to prove that Spinoza had no durable influence upon him, at least as regards fundamentals. The question therefore arises why some things exist rather than others. The reply, to which, in published works, Leibniz always gave a theological turn, was that that world is actual in which there is the greatest metaphysical perfection, *i.e.*, in which the greatest quantity of essence exists. The conflict of possibles, he says, results in the greatest number of compossibles (*Gerh.*, vii., 194). This is the "divine mathematics" or "metaphysical mechanism" of which we hear so much (p. 227). Leibniz's optimism was logico-mathematical: perfection was merely a quantitative maximum.<sup>7</sup> But the question for us is: How does this view follow from the principle of reason? The answer to

---

law of contradiction is only one. I do not know whether he attributes this position, which solves the above difficulty as well as many others, to Leibniz.

<sup>7</sup> P. 231. M. Couturat adds "or minimum"; but metaphysical perfection in itself is always a maximum, though in some mathematical problems—*e.g.*, the principle of least action—a minimum appears as an alternative.

this question turns on the theory of existence. On this theory, he makes two classes of remarks, which both he and M. Couturat appear to regard as mutually consistent, but which seem to me radically opposed to each other. On the one hand, we are told that existence is a perfection, and that there is something more in the concept of what exists than in that of what does not exist, whence our author concludes (RMM, p. 13) that existence, like any other predicate, is contained in subjects of which it can be truly affirmed. But again Leibniz says: "If existence were anything other than the exigence of essence, it would follow that itself would have a certain essence, or would add something new to things, concerning which it might again be asked, whether this essence exists, and why this rather than another" (*Gerh.*, vii., 195n.). This passage sounds like a refutation of the others; nevertheless it is not so regarded by Leibniz, for he says: *Existentia a nobis concipitur tanquam res nihil habens cum Essentia commune, quod tamen fieri nequit, quia oportet plus inesse in conceptu Existentis quam non existentis, seu existentiam esse perfectionem; cum revera nihil aliud sit explicabile in existentia, quam perfectissimam seriem rerum ingredi* (RMM, p. 13n.). The end of this very instructive passage seems to imply that existence *means* belonging to the best possible world; thus Leibniz's optimism would reduce itself to saying that *actual* is an abbreviation which it is sometimes convenient to substitute for *best possible*. If these are the consolations of philosophy, it is no wonder that philosophers cannot endure the toothache patiently! The whole theory is so radically vitiated by the analytic theory of judgment that it seems impossible to state it at all clearly.<sup>8</sup> But the use of the

<sup>8</sup> M. Couturat's work has led me to abandon the theory that Leibniz held existential propositions to be synthetic—with regret, since the theory he did hold appears to me very inferior to the one which I imputed to him in my *Philosophy of Leibniz*. It is clear, at any rate, that Leibniz regarded "truths of fact" as analytic in 1686, when his system was new and he had not yet

principle of sufficient reason is quite plain from the discussion in *Gerh.*, vii., p. 194, where it is laid down that "the first truth of fact, from which all experiences can be proved *a priori*, is this, namely: *Everything possible demands that it should exist*". And this principle is proved by observing that, unless there were some inclination to exist involved in essence itself, nothing would exist, since no reason can be given why some essences should demand existence rather than others. Thus essences range themselves in the conflict on the side of those with which they are compossible, and a tug of war results, in which the majority are victorious. An interesting conflict of ghosts all hoping to become real! But it is hard to see what God has to do in that *galère*.

Sciences dealing with actual existents, as appears from the above theory, were for Leibniz just as *a priori* as other sciences. Immediate internal experiences are first truths for us, but not absolutely; experience is only confused reason (pp. 256, 259). Induction, as understood by empiricists, is absolutely condemned by Leibniz, as insufficient and even misleading (p. 261). Deduction is for him the only method, and abstract mathematics is the true logic of the natural sciences (p. 271). These views are not in harmony with those of most modern logicians, but

---

forgotten his reasons for it. In later years, however, expressions occur which are difficult to reconcile with this view, such as: "Truths of fact are contingent and their opposite is possible" (1714; *Gerh.*, vi., 612); "A truth is necessary when the opposite implies contradiction; and when it is not necessary, it is called contingent" (1707; *Gerh.*, iii., 400); "when any one has chosen in one way, it would not imply a contradiction if he had chosen otherwise" (1711; *Gerh.*, ii., 423). Such passages can only be reconciled with M. Couturat's view by the distinction between explicitly and implicitly analytic propositions; where an infinite analysis, which only God can perform, is required to exhibit the contradiction, the opposite will *seem* to be not contradictory. The only other escape I can imagine, which appears to be that favoured by M. Couturat, would be to suggest that the denial of an analytic truth might be not self-contradictory; this mode of escape, however, would not, I think, commend itself to Leibniz.

I cannot help thinking, with M. Couturat (p. 271n.), that there is no valid inference which is not deduction, and that induction, in so far as it is not disguised deduction, is merely a method of making more or less plausible guesses. Where Leibniz erred was, not in insisting that deduction is the only method of inference, but in failing to realise that the number of independent premisses, obtainable only, if at all, by immediate inspection, instead of being two, is strictly infinite.

Chapter vii. deals with Universal Mathematics—a subject which appears to be precisely identical with what Mr. Whitehead has called Universal Algebra. Although M. Couturat deals with this subject in a different chapter from that devoted to the Logical Calculus, he does not clearly state, any more than Leibniz does, the exact difference between the two. The fact is that the *Ars Combinatoria*, or Universal Mathematics, is more formal than the Logical Calculus: it is concerned with deductions from the assumption of a synthesis obeying such and such laws, but otherwise undefined. We may say that, in this subject, our signs of operation, our  $+$  and  $\times$  and whatever other such signs we may employ, are themselves variables, subject merely to hypotheses as to their formal laws; whereas in every other branch of mathematics, and in the Logical Calculus itself, only the letters are variable, and the signs of operation have constant meanings. It might seem, from this account, as though Universal Mathematics were the most general of all mathematical subjects, and in a sense this is true. But it is emphatically not the logically first of such subjects, for itself employs deduction and the logical kinds of synthesis, which are explicitly dealt with in the Logical Calculus. Moreover, in order that any deductions from an assumed formal type of synthesis may have importance, it is necessary that there should be at least one synthesis of the type in question; and this can never be proved by the *Ars Combinatoria* itself. This science, therefore, is logically subsequent to the Logical Calculus. The matter may be stated thus:

In every proposition, when fully stated, there must be constants, *i.e.*, terms whose meaning is not in any degree indeterminate. When we turn our symbols of operation into variables, we do not thereby remove all constants from our propositions, for the formal laws to which our operations are to be subjected will require constants for their statement. I have succeeded in reducing the number of indefinable terms employed in pure mathematics (including geometry) to eight (a number which may be capable of further diminution), by means of which every notion occurring throughout the whole science can be defined. Thus all mathematics is merely the study of these eight notions; and the Logical Calculus is a name for the more elementary parts of this study. We have here precisely such a development as Leibniz desired to give to all subjects—with the difference, due to the fact that propositions are synthetic, that the indemonstrable axioms of mathematics, instead of being one, appear to number about twenty.<sup>9</sup> Thus Symbolic Logic is distinct from, and logically prior to, the subject which Leibniz calls Universal Mathematics. But the notion of different possible algorithms was very attractive to Leibniz, and the Logical Calculus presented itself to him as that species of the Calculus of Combination which is subject to the law of tautology ( $aa = a$ ) as well as to the commutative law. This and the geometrical calculus were the two that he endeavoured to develop out of the infinity of algorithms that appeared to him possible (pp. 320–21).

M. Couturat's researches into Leibniz's work on Sym-

<sup>9</sup> The only ground, in Symbolic Logic, for regarding an axiom as indemonstrable is, in general, that it is undemonstrated; hence there is always hope of reducing the number. We cannot apply the method by which, for example, the axiom of parallels has been shown to be indemonstrable, of supposing our axiom false; for all our axioms are concerned with the principles of deduction, so that, if any one of them be true, the consequences which might seem to follow from denying it do not follow as a matter of fact. Thus from the hypothesis that a true principle of deduction is false, valid inference is impossible.

bolic Logic are exceedingly interesting: they show the great progress he had made, and the precise causes of his failure. He occupied himself with this subject principally at three periods, 1679, 1686, and 1690. The second of these dates is interesting, for M. Couturat has found a long MS. which completes the *Discours de Métaphysique* and shows its connexion with Leibniz's logical studies. The editors, as our author remarks, are the more unpardonable in having omitted this MS., as Leibniz has written on it: *Hic egregie progressus sum* (pp. 344-45).

The system of 1679 represents simple concepts by primes, and conceives their combination on the analogy of arithmetical multiplication. At first, Leibniz thought one number would do for each concept; but he soon found that negative terms were required, and for these he employed negative numbers. Here, however, the rules of composition could no longer be made analogous to those of arithmetic. In order that a complex notion should be possible, it was necessary and sufficient that the positive and negative numbers representing it should have no common factor. He proves many theorems, notably one which he calls *præclarum theorema*: If  $a$  is  $b$  and  $c$  is  $d$ , then  $ac$  is  $bd$ . He also arrives at the logical definition of cardinal numbers, recently revived by Frege and Schröder: thus he says that  $m$  is one when, if  $a$  is  $m$  and  $b$  is  $m$ , it follows that  $a$  and  $b$  are identical (p. 342). Once only he represented by multiplication what we call logical addition, and obtained the law of tautology for this case also; but he was unable to develop this idea, because he preferred the point of view of intension (p. 343).

In the system of 1686, Leibniz discovered the double interpretation of formulæ, according as single letters stand for concepts or propositions (p. 354). But he involved himself in hopeless difficulties owing to his determination to rescue scholastic logic at all costs. His calculus rightly refused to justify faulty conversions, or to give existential import to universal terms. He remarks: "All laughers are men, therefore some man laughs; but the first

is true even if no man laughs, while the second is not true unless some man actually laughs" (p. 359). To avoid this difficulty, he says that all terms are to be tacitly assumed to exist (p. 360); nevertheless he has to admit the impossible, *i.e.*, that there are general terms which do not exist (p. 349). If he had had less respect for scholastic logic, M. Couturat concludes (p. 354), the Algebra of Logic would have been constituted some 200 years sooner.

The system of 1690 adds little to its predecessors. Leibniz thought that the formulæ for intension and extension were the same, which is only true when addition is everywhere changed into multiplication and *vice versa* (p. 374). M. Couturat sums up his account by saying that Leibniz possessed almost all the principles of Boole and Schröder, and in some points was more advanced even than Boole; but he failed to constitute symbolic logic because it cannot be based upon the vague idea of intension (pp. 386–87). There is, no doubt, a certain broad truth in this statement: the Logical Calculus undoubtedly requires a point of view more akin to that of extension than to that of intension. But it would seem that the truth lies somewhere between the two, in a theory not yet developed. This results from the consideration of infinite classes. Take, *e.g.*, the proposition "Every prime is an integer". It is impossible to interpret such a proposition as stating the results of an enumeration, which would be the standpoint of pure extension. And yet it is essentially concerned with the terms that are primes, not, as the intensional view would have us believe, with the concept *prime*. There appears to be here a logical problem, as yet unsolved and almost unconsidered; and in any case, the matter is less simple than M. Couturat represents it as being.

Leibniz's Geometrical Calculus, which is discussed in chapter ix., is distinctly disappointing. He was not satisfied with analytic geometry, for it is not autonomous, but requires synthetic proofs of its foundations (p. 400). Not Algebra, he says, but a "more sublime analysis" is the true



Characteristic of Geometry (p. 388). What he should have invented was Grassmann's Calculus of Extension; he had at one time the idea of projective Geometry, *i.e.*, of a Geometry using only straight lines, and for this he wanted a "linear analysis" (p. 404n. and p. 409). He held the view—which, in spite of Kant, is now known to be correct—that Geometry does not depend upon figures for its proofs, but on intelligible relations (p. 401). He made endeavours to analyse these relations: position, he says, distinguishes objects having no intrinsic distinction, but this applies equally to magnitudes, and he failed to make a philosophic analysis of position (pp. 407–8). The fact is that the above is a mark of all asymmetrical relations whose terms are simple; but this fact was a contradiction for Leibniz, as for most modern philosophers, owing to the subject-predicate theory of propositions.

Leibniz at first endeavoured, in his geometrical calculus, to deal with the two relations of similarity and congruence; but later, he dealt with congruence only (pp. 411, 417). From congruence alone he obtained definitions of the straight line and plane; but he was unable to deduce that there are straight lines, or that they are determined by any two of their points (p. 420). He justly remarks: "Imagination, taken from the experience of the senses, does not permit us to imagine more than one intersection of two straight lines; but it is not on this that the science should be founded" (p. 422). He took distance to be independent of the straight line and anterior to it (p. 417); but he was unable to deduce the fundamental properties of the straight line. He failed to make a Geometrical Calculus, and merely introduced a new and less convenient system of co-ordinates, the system of bipolars or tripolars; and his failure was due to his remaining metrical.

This metrical bias is attributed by M. Couturat (pp. 438–39) to respect for the "narrow, poor and stunted principles of Euclid's Geometry". Doubtless respect for Euclid was one cause of failure; but it appears to me highly probable that the relational theory of space was a

more potent cause. When I formerly held this theory, I made almost exactly the same attempts to base Geometry on distance; and if the relational theory were true, such a basis would be alone correct. The straight line, it is true, is generated by a relation, but this relation holds, for a given straight line, between only *some* points and some others, whereas a given relation of distance holds between *every* point and some others. Thus the generating relation of a straight line picks out some points of space as inherently peculiar, so that the straight line, if taken as fundamental, is fatal to thorough-going relativity. Nevertheless, geometry imperatively requires that the straight line should be made fundamental, though distance can be introduced with advantage as a late and derivative notion. A mere mathematician might have been unaffected by this consequence of the relational theory, but not so a philosopher such as Leibniz; and in the discussions with Clarke, the necessarily fundamental nature of distance, in any such theory, often very plainly appears (*e.g.*, *Gerh.*, vii., 400, 404).

In a short conclusion, M. Couturat sums up his results, and ends with an impressive warning against too great respect for authority. Leibniz, he says, was not the autodidact that he boasted himself to be, and erudition interfered with his originality. "We shall never know the price that the human mind has had to pay for over-perfect works such as the *Organon* of Aristotle and the *Elements of Euclid*, nor by how many centuries they have retarded the progress of the sciences by discouraging innovators" (p. 440). An admirable remark for readers! As for authors, the danger of producing over-perfect works is one which is by no means pressing, and need scarcely disturb their equanimity.

The work ends with five appendices and a number of notes, in which much useful information will be found. In the article on Leibniz's metaphysic already referred to, which should be read in connexion with the book, the main outlines of his doctrine of monads are deduced, in

his own words, from his logical principles. It is also shown that his Dynamics had very little influence on his philosophy, though his philosophy had much influence on his Dynamics (p. 21ff.). This is established beyond question by a MS. of 1676, in which most of his metaphysical theories are already to be found, in combination with a belief in atoms (p. 24). The general conclusion, that Leibniz's logic was the true foundation of his whole system, seems thus to be once for all demonstrated.

It has been necessary, in the above account, to review Leibniz as well as M. Couturat, for it may almost be said that the work constitutes a new book by Leibniz.<sup>10</sup> For those who have not read this book, it will be impossible henceforth to speak with authority on any part of Leibniz's philosophy.

Dr. Cassirer, like M. Couturat, regards Leibniz's Logic and his investigations of the principles of mathematics as the source of his metaphysical system. Nevertheless his book differs very widely from M. Couturat's in its theory as to Leibniz's opinions and as to the logical and historical order of the various parts of his philosophy. Unlike M. Couturat, the present author has not yet grasped the very modern discovery of the importance of Symbolic Logic. In the philosophy of mathematics, his views appear to agree closely with those of Prof. Hermann Cohen,<sup>11</sup> to whom the book is dedicated, and to whom acknowledgments are made in the Preface. We find, accordingly, in spite of occasional references to Dedekind and Cantor, but little realisation of even the arithmetising of mathematics, and none at all of the still more recent "logicising," if such a word be permissible. Mathematics, for Dr. Cassirer, is not synonymous with Symbolic Logic, and Logic

<sup>10</sup> M. Couturat is publishing a large collection of unpublished Leibniz MSS., which will appear shortly.

<sup>11</sup> Cf. especially *Das Princip der Infinitesimal-methode und seine Geschichte*, Berlin, 1883. This work, though admirable in its historical parts, is now antiquated in its constructive theories.

is synonymous with theory of knowledge. In both these respects, the work is Kantian, and supposes Leibniz, at least in a measure, to be also Kantian. The very rare merit of not imputing one's own philosophy to the author one is discussing belongs to M. Couturat's work, but not, I think, to Dr. Cassirer's; and as mathematics have of late conclusively disproved the Kantian doctrines as to their principles, the result is to rob Leibniz of his most extraordinary merit—I mean, the realisation of the supreme importance of Symbolic Logic.

The work, we are told in the Preface, arose out of questions as to the foundations of mathematics and mechanics. The mathematical motive was paramount in the formation of Leibniz's system, which is not to be judged by the rigid dogmatism of the *Monadology*. Kant's results—e.g., as regards the ideality of space and time—were largely anticipated by Leibniz: the originality of the Critical Philosophy lay rather in the form and method than in the results. Leibniz—so the difference is stated in a later passage (p. 264)—says that the methods of knowledge, *though* ideal, are valid for the real: Kant's originality lay in turning *though* into *because* in this statement.

After a long Introduction on Descartes' critique of mathematical and scientific knowledge, the body of the work is divided into four parts, dealing respectively with Mathematics, Mechanics, Metaphysics, and the growth of Leibniz's system. All knowledge, the Introduction asserts, is for Descartes really mathematics, and magnitude is the fundamental concept of mathematics. Moreover, magnitude is essentially connected with space, and is by Descartes almost identified with extension. By attempting to reduce everything to space, he failed to give due weight to time, and so failed to found Dynamics: his notion of force is only valid for Statics. In his notion of substance he failed to hold fast its deepest meaning, which is (p. 60) "to postulate as a condition of the object the thoroughgoing unity of knowledge".

In Part I, the first chapter deals with the relation of

mathematics and logic. Leibniz assigned to Aristotle the merit of having first written mathematically outside mathematics. All certain knowledge, Leibniz says, incorporates logical forms (of which, however, some are not Aristotelian). Dr. Cassirer, in a true Kantian spirit, remarks that this view is problematical, if Algebra and Geometry contain an independent contribution to method: to reduce mathematics to logic is to loosen its connexion with the sciences of experience and nature (pp. 107-8). To this we must reply that it is now *known*, with all the certainty of the multiplication-table, that Leibniz is in the right and Kant in the wrong on this point: Algebra and Geometry do *not* contain an independent contribution to method; and as for the connexion of mathematics with the sciences of experience, this is precisely the same as that of logic with the said sciences, *i.e.*, they cannot violate mathematics, which is concerned wholly and solely with logical implications, but also they all of them, including the geometry of actual space, require premisses which mathematics cannot supply. This conclusion, originally suggested by non-Euclidean geometry, has now, by the labours of Weierstrass, Cantor and Peano, been wholly removed from the region of dubitable hypothesis.

The author proceeds to discuss the relative importance of definitions and identical principles in Leibniz's proofs of axioms. He decides (p. 109) that the true principles are definitions, while the identical propositions are mere auxiliaries. I do not know whether this view is more tenable than the opposite: Leibniz's opinions could not be clear, as either alternative was absurd, for an identical proposition, if there were any such thing, would be perfectly trivial, while a definition is merely a statement of a symbolic abbreviation, giving information as to symbols, not as to what is symbolised. But here Leibniz's doctrine as to the possibility of ideas becomes relevant—his theory that all (complex) ideas involve a judgment. Dr. Cassirer speaks as though, in this notion, there were for Leibniz no difficulties: the mutual compatibility of all simple

ideas is not mentioned. This is an instance (of which others might be given) of failure to apprehend the reasons why Leibniz's system cannot be accepted as final truth. A concept, Dr. Cassirer says, is not for Leibniz merely a sum of given marks, but the result of a judgment (p. 117). Yet M. Couturat's account of the attempts to construct a Symbolic Logic shows that the opposite statement is at least equally correct, and that there is in fact a contradiction at this point. Possibility, Leibniz says, may be proved by experience of actuality as well as *a priori*. This, the author remarks, shows that the decision of possibility goes beyond ordinary logic, and presupposes the foundations of scientific knowledge (pp. 112-13). The consequence, I think, is scarcely Leibnizian; for where there is no *a priori* proof of possibility, this is because a complete analysis has not been effected, so that we do not know *what* it is whose possibility is proved by experience. Logic, the author continues, is to be transformed from a science of the forms of thought into one of objects; this is to be effected by mathematics, which mediates between ideal logical principles and the reality of nature (p. 123).

Chapter ii., on the fundamental concepts of quantity, points out that Leibniz, like Descartes, starts from quantity, but in the form of number, not of extension: the effect of having started from discreteness is visible throughout his work. He was guided, says the author, by the notion of the identity of logic and mathematics, where logic, to begin with, must be the logic of quantity. But Algebra is not the general logical method, and the science of quantity leads to that of quality. The next chapter, on the geometrical problem of space, asserts that the further development of the notion of quantity is to be derived from the Infinitesimal Calculus, whose presuppositions are not arithmetical merely, but spatial. As a statement of Leibniz's view, this is probably correct; as a statement of the facts, it has been disproved by Weierstrass and the arithmetical theory of irrationals. The essence of space, Leibniz points out—and this is an important truth—is not

magnitude, for magnitude belongs also to number, time, and motion, and does not belong to the point, which is yet spatial. Leibniz's  $x$  in his *Characteristic*, Dr. Cassirer says, is not a true variable, but a collection: it is not obtained, as in the true notion of the variable, by varying one identical element (p. 155). This remark is not easy to understand, but if it means, as it seems to do, that a variable varies, or has some dependence upon time and change, it is certainly mistaken. The nature of the variable is the fundamental problem of mathematical philosophy, and I do not know any satisfactory theory on the subject. But it is quite certain that the variable is a purely logical notion, introducing only such concepts as *class*, *any*, *some*, and logical implication; to make it depend upon time is to make the mathematical treatment of time itself logically impossible, and to misunderstand the abstractness of Symbolic Logic, in which, though time is absent, the variable is present throughout. The nature of the variable, in fact, is more akin to that of logical disjunction than to any notions involving variation or change.

Chapter iv. deals with the problems of continuity, infinity and the infinitesimal. The exposition is historically careful, and appears to take note of all important passages; but the author's own views are, on these subjects, apparently more in agreement with Leibniz's than modern mathematics will permit. He writes, however, in this chapter, with a certain reserve (*e.g.*, p. 218), which makes it difficult to feel certain as to his opinions, or even whether they are definite.

The differential, we are told, is constituted by the qualitative unity of a law, while the integral denotes a magnitude as generated by a law (p. 170). Zero as a limit has positive significance:  $dx$ , though quantitatively zero, retains the character of what vanishes, and is intelligible, not as a single quantum, but only in the process. Leibniz showed the impossibility of regarding the continuum as a single datum: only by a law of becoming can it be understood. Thus continuity requires change, but change

thereby becomes the necessary presupposition of the concept of reality (p. 185). A simple substance, for Leibniz, is the law of a series, whose terms are the states of a substance (pp. 187-88): or again, it is the general term of the series (p. 538). The constancy presupposed in the conception of being is no longer the unchangeability of a thing, but the methodical constancy of the rule according to which the content varies (p. 189). In these views, which are supported by texts from Leibniz, we must, when we inquire into their truth, distinguish two elements, the mathematical and the philosophical. Leibniz's belief that the Calculus had philosophical importance is now known to be erroneous: there are no infinitesimals in it, and  $dx$  and  $dy$  are not numerator and denominator of a fraction. The doctrine of limits, by careful statement, has been found alone adequate, and has shown that the Calculus is an advanced and purely technical development of the science of order. The continuum is essentially a single datum, in the sense that it is the field of a given relation; but the essential properties of continuity belong primarily to the relation, and belong to the terms composing its field not *qua* class of terms, but only *qua* field of a continuous relation. Continuous relations, so far from depending upon time or change, are not known even to occur in temporal series: the only indubitable instances of such relations are derived from Arithmetic. So far for what mathematics has to say. As regards philosophical questions, I confess that I fail wholly to understand what is meant when it is said that reality presupposes change, or that the constancy presupposed in Being is not unchangeability, but the constancy of a rule of variation. Change of what? from what? into what? one must ask; and these questions can only be answered by means of logical concepts, whose Being is free from dependence upon time, and is thus necessarily unchangeable. Change in an identical content means difference in its relations to different moments of time; but the content must remain strictly self-identical, and this self-identity is logically prior



to change, not subsequent to it. Again, neither Leibniz nor Dr. Cassirer has realised what is meant by the constancy of a rule, the law of a series, etc. These notions mean that the terms whose law is constant are the field of a serial relation: there is nothing constant, so the position may be stated, except the serial relation itself. But the constancy of this relation is precisely the absolute timeless self-identity which was to have been banished; and this will still have to belong to terms as well as to relations, if different relations are to have different fields in any significant sense.

The same desire to make conceptions fluid appears in Leibniz's definition of equality as infinitesimal inequality. Following Cohen (*op. cit.*), Dr. Cassirer approves this definition, and adds that, in modern language (*i.e.*, Cantor's), two magnitudes are equal when they are defined by equivalent fundamental series, *i.e.*, *by such as have between corresponding terms differences whose limit is zero* (p. 194). The gloss in italics introduces a quantitative notion wholly foreign to the essence of limits. Equality, to begin with—although, where irrationals are concerned, Cantor's language is ambiguous—is never *defined* by fundamental series, but by absolute identity. And fundamental series may be equivalent, *i.e.*, may have the same limit (if any), or define the same segment in any case, although the difference of corresponding terms is constant and infinite.<sup>12</sup> Thus when Dr. Cassirer remarks (p. 197) that the very notion of exactitude is now altered, we must reply: Yes, into inexactitude.

Infinity, the author points out, is for Leibniz that of a distributive, not of a collective, whole: it is not a property of a single datum, but essentially of an infinite process. It is the continuation of a law as against every single term created by the law (pp. 200ff.). This seems to mean that

<sup>12</sup> For example, if  $\omega$  represents the ordinal number of the finite integers in order of magnitude, the series whose general terms are respectively  $\omega \times 2n$  and  $\omega (2n + 1)$  both have  $\omega^2$  for their limit, although the difference of corresponding terms is always  $\omega$ .

there are relations whose fields cannot in any way be treated as units, and which are such that no finite number of terms constitutes the whole of the field. The difficulty of the view lies in the fact that to be the field of a given relation is in itself a kind of unity, and seems to imply necessarily the existence of a collective whole. But to pursue this subject would take us into the darkest corners of logic. Infinitesimals, it is pointed out (p. 207), are stated by Leibniz to be merely useful fictions. On this point, there is the greatest difficulty in discovering his true opinion, for he certainly used notions derived from the Calculus in establishing force, and in many ways the infinitesimal seems to be involved in his philosophy. But Dr. Cassirer appears to be unconscious, or nearly so, of the magnitude of this inconsistency.

The Law of Continuity is also discussed in chapter iv. The single concept, we are told, in order to be understood in its origin, must no longer be regarded as a rigid and immovable logical entity: its being is only determined in connexion with a logical system, and the system of concepts must assimilate the notion of logical development. The postulate of continuity is not intelligible if a given material is to be described, but only because it is one of the fundamental acts by which consciousness conditions the object. In more special forms, the law of continuity asserts that extreme cases, from some points of view excluded, may yet be included in general theorems, *e.g.*, propositions concerning the ellipse will hold for the parabola. The general statement is: *Datis ordinatis etiam quæsitæ sunt ordinata*. M. Couturat points out (p. 233), what Dr. Cassirer appears not to have observed, that this principle is regarded by Leibniz as a consequence of the principle of reason; the deduction, however, unlike most of the others, is invalid.<sup>13</sup> Moreover the principle is false, in fact, unless it means, what would be perfectly trivial, that the consequents are ordered by the mere correlation

<sup>13</sup> In this M. Couturat informs me that he agrees with me.

with the data. Take, for example, the series of rational fractions in order of magnitude, each in its lowest terms. The numerators of these fractions are one-valued functions of the fractions, but have no order except that resulting from the correlation itself. Again, in the case of the ellipse and the parabola, the latter has some but not all of the properties of the former, and the mathematician's desire to treat such different cases together, though praised by Dr. Cassirer (p. 221), has been a source of constant and most pernicious fallacies. The principle of continuity, therefore, must be regarded as one of the most unfortunate parts of Leibniz's philosophy. Mathematically, it is false; and the philosophical meaning suggested by our author seems to amount to the assertion that everything is really something else—a principle whose merit is, that it excuses us from the necessity of understanding anything because it isn't really the thing we don't understand.

Part ii., on Mechanics, opens with a chapter on Space and Time. Time, it says, is the independent variable in regard to all related magnitudes (p. 257). This assertion is often made, without, I believe, any knowledge of its exact meaning. The only exact meaning of which it is capable is, that any relation relating all the moments of time respectively to various magnitudes of a given kind may be many-one, but cannot be one-one or one-many.<sup>14</sup> This is of course more or less true of important relations; but if there is any material particle which is never twice in the same position in space, then, as far as that particle is concerned, the principle is false, and the positions of the said particle might be taken as independent variable instead of the moments of time. Leibniz's doctrine of space and time is said—and I think rightly—to be astonishingly like Kant's: space and time are not real, nor relations of self-subsistent reals, nor abstract conceptions in

<sup>14</sup> A relation is many-one when a given term has the relation to at most one other, one-many when its converse is many-one, one-one when it is both many-one and one-many.

the sense of being derived from sense-data; they are creations of the mind, belonging to the system of pure principles of knowledge, by which the possibility of objects as phenomena is secured (p. 263).<sup>15</sup> Space and time are orders of phenomena, not of substances; their ideality was first inferred from the difficulties of the continuum. When monads are said to have position, this is only to be understood figuratively: the spatial order of phenomena is not the image of a non-spatial order of substances; we might regard the monad as the expression of spatial order, but not spatial order as reflecting the order of monads. Time and space, as against Descartes, are co-ordinated by Leibniz. There is nothing constant in things but the law of the series, and the time order, as with Kant, is deduced from causality, not *vice versa*.

The next chapter (chap. vii.), on the conception of force, utilises the doctrines as to the differential which one would have supposed the rejection of the infinitesimal would have rendered unavailable. The first postulate, it says, by which the real is defined, is determinateness of content in the moment; but this content has being only as a term in the series, not in isolation. Thus the momentary content must be conceptually fixed by a law involving past and future. This is effected by *force*, which, we are assured, is for Leibniz synonymous with reality (p. 288). Force is a special form of differential: it is what is real in motion, *i.e.*, the present state as pre-involving the future. The new mathematical method, we are told—and Leibniz does seem to have held this view—enables us to retain the Eleatic postulates as to the rational conditions of being, without excluding plurality and change (p. 292). This claim can be made, we must reply, not by the Calculus, but by the principles of Weierstrass and Cantor: indeed Weierstrass may be regarded as the modern Zeno,

<sup>15</sup> In my opinion, Leibniz had also another theory inconsistent with this one, and *if* monads mirror the universe, there must be real relations corresponding to the spatial relations of phenomena; but this is a point to which I shall return later.

since he, first of moderns, accepted the principle of Zeno's argument, rejected by Dr. Cassirer, that every value of a variable is a constant. (This is the abstract form of the assertion that the arrow in its flight is always at rest.)

The principle of conservation is next discussed. Previous and subsequent events are always connected by an equation, "cause = effect". The possibility of satisfying the equation itself decides what events are causally related: the cause is an event, just as the effect is. The principle of conservation is not got from experience, but is a postulate. Dr. Cassirer appears not to perceive that it involves an assertion as to the connexion of past and future which may or may not be true, and which elsewhere Leibniz explicitly denies. All equations are logical equations, *i.e.*, they state mutual implications; hence if any phenomena can be found to satisfy the equation "cause = effect," there must be events at different times so related that *each* implies the other. Hence the effect is on the same logical level as the cause, and the past has no logical priority over the future. Leibniz holds, however, that the past is prior in nature to the future (*e.g.*, *Gerh.*, iii., 582); and M. Couturat has shown that this opinion is a vital part of his system (Couturat, p. 222). But Leibniz had not a sufficient knowledge as to the nature of logical priority, or as to the connexion of Symbolic Logic with Mathematics, to have understood the inconsistency into which he was led on this point. Dr. Cassirer holds (p. 331) that it was for the sake of the principle of conservation that Leibniz denied the interaction of soul and body. In view of the texts in the letters to Arnauld and in M. Couturat's work, this view appears to me no longer tenable: the logical argument is short, clear, and on its own premises valid. I see therefore no reason to require any other ground for Leibniz's opinion.

Part iii., on Leibniz's Metaphysics, endeavours to show that his views were practically those of Kant, and that they were derived largely from his scientific studies, especially from Dynamics. Both these opinions appear to me to be

erroneous. In rejecting the latter, I agree wholly with M. Couturat;<sup>16</sup> and as he has new documentary evidence, his position may, I think, be regarded as established. The question as to the interpretation of Leibniz's metaphysics is more difficult. Dr. Cassirer regards the passages in the letters to Arnauld as treating the relation of the Ego to its states as *analogous* to that of subject and predicate (p. 358). For my part, I cannot discover any justification for seeing a mere analogy where absolute identity appears to be plainly asserted. The positing of identity, says our author, is only understood by reduction to the conception of the Ego (p. 360). The passage in *Gerh.*, ii., p. 43, appears to me to show quite conclusively that the reduction is the other way. I confess that a subjective view of identity is to me unintelligible. Identity, Dr. Cassirer says (p. 131), is not found by thought, but created in the progress of knowledge. This means that there is no identity until we think so. Nature presents me with Jones, and I, wishing to see my old friend Smith, postulate that it is Smith; and thereupon, as by magic, the thing is done. But what it was I wished, seeing that before my wish the identical Smith had no kind of being, it seems totally impossible to conceive. The whole view, in short, confounds the process of learning with the facts learned, and is unable to conceive propositions except as mental existents. And it seems a sufficient refutation, in the case of identity, to point out that, on the theory in question, the assertion that the Ego persists is purely linguistic, and has no significance except as part of a dictionary.

In a similar subjective spirit, our author discusses the question of perception. The object is a well-founded phenomenon, not because it reflects a transcendent world of absolute existents, but because it represents an order which satisfies the scientific reason (p. 364). In other words, the scientific reason is satisfied by a tissue of falsehoods. The world of bodies is only a content of thought;

<sup>16</sup> See the end of the review of M. Couturat, *supra*.

there is no *ground* for the existence of phenomena. It is a mistake to suppose that Leibniz constructed bodies out of monads. The organic body is not a new element in the monad, but a determination of the content of consciousness (p. 408). To say that monads mirror the universe is only a figurative expression: there is no absolute object, such as would be required for mirroring. It might seem to have been forgotten that there are many monads; but Dr. Cassirer adds (p. 468) that the perceptions of a single substance are not of the system of absolute substances. Since this system alone is real, it follows, one must suppose, that all perceptions are wholly mistaken: for what they perceive is unreal, and what is real they do not perceive. Our objects, we are told, are entirely spatio-temporal phenomena, and monads are not objects of either clear or confused perception (p. 468).

I am far from denying that many passages in Leibniz support this interpretation; but they belong, I think, almost all, to later years, when he had forgotten that his system needed grounds. Before examining the view, I should like to remove an objection, urged by Lotze and endorsed by the author (p. 467), against the view that monads mirror the universe. One thing *expresses* another, according to Leibniz, when there is a one-one relation of the parts of the one to those of the other, as, *e.g.*, in geometrical projection (*e.g.*, *Gerh.*, ii., 112; vii., 264). Now such a relation is possible both between every pair of monads and between every monad and the whole system of monads. To take an illustration from Arithmetic: consider the various series whose general terms are respectively  $1 - 1/n$ ,  $2 - 1/n$ ,  $3 - 1/n$ , etc., where  $n$  is to take successively all positive integral values. Each of these series is similar both to every other series and to the whole series of series. If every term of each series stood for a state of a monad, and each whole series for a whole monad, we should get here a perfectly Leibnizian world, in which monads would all mirror both each other and the universe. Thus Lotze's objection, to which Dr. Cas-

sirer answers by abandoning the notion of mirroring the universe, appears to be based upon an error.

In order to judge of the philosophy attributed to Leibniz by our author, let us endeavour to state it in precise and un-Kantian terms. Every monad is a causal series, the series being definable by the relation of causality (which must be taken as ultimate) and any one of the terms of the series. All the series are ordinally similar, and corresponding terms are called simultaneous. (This is in fact the meaning of simultaneity.) Not only do the various series correspond term for term, but also all the parts of corresponding terms (each term being infinitely complex) correspond in the way required for interpreting the dictum that each monad mirrors the universe. Each term is what is called a momentary state of the monad; the monad itself is the generating relation of the series.<sup>17</sup> Each state of a monad is composed of perception and appetite. The latter is an embodiment, in a confused manner suggested by the Calculus and the subject-predicate logic, of the generating relation of the series. The former is a belief in the existence of what are called phenomena—the world of matter in time and space—which however do not exist. Such in outline is the philosophy attributed to Leibniz. Except as regards appetite, there is, I think, no logical contradiction in this system. There is, however, an empirical fact—which, unluckily for themselves, the supporters of the system cannot deny—which is logically inconsistent with it; and that is the fact that parts, at least, of the system have been believed. For the subjective theory of phenomena leads, with the doctrine of the corre-

<sup>17</sup> Dr. Cassirer sometimes speaks of the monad, as Leibniz himself does, as the law of the series; sometimes (p. 538) as the general term of the series. But neither of these notions has the necessary precision: a law is merely a confused way of describing a relation, and as for the general term of a series, there is properly no such entity. When the general term is expressed mathematically as a function of a variable number, the expression indicates that the series is defined by a certain relation correlating its terms respectively with the various numbers.



spondence of monads, to the conclusion that whatever has been or will be believed is false; and a philosophy leading to this conclusion can only be true if no one advocates it. The conclusion will, of course, be denied by supporters of the theory; but the consequence follows inevitably from the doctrine that "only indivisible substances and their various states are absolutely real" (*Gerh.*, ii., 119), together with Dr. Cassirer's opinion that monads are not objects of either clear or confused perception. For it cannot be maintained that there is another sort of knowledge besides perception, unless at most in regard to God and the eternal truths. To distinguish other knowledge of what exists from perception, it would be necessary to define perception as causally related to its object—a course which is inadmissible in a Leibnizian system.

But innumerable grounds concur in making it improbable that the above were Leibniz's opinions. In the first place, the attempt to infer Monadism from Dynamics, which Dr. Cassirer attributes to Leibniz, would surely be absurd, if the phenomena with which Dynamics deals are not appearances of monads, but are a mere phantasmagoria in each monad. Solipsism is the legitimate outcome of such a theory. The plurality of monads must have either been deduced from phenomena, or assumed quite arbitrarily. Again, the organic body, which Dr. Cassirer treats as part of the monad, is said by Leibniz to be composed of subordinate monads (*e.g.*, *Gerh.*, vi., 598); and it is constantly affirmed that monads are dispersed throughout matter (*e.g.*, *Gerh.*, ii., 135, 295, 301; vi., 608; vii., 330). In fact, as soon as matter is regarded as *merely* phenomenal, and not a confused perception of actual monads, all the scientific grounds for Leibniz's views, which are so dear to our author, vanish into thin air. The only remaining ground for plurality of monads would be metaphysical perfection—a principle of which the work before us takes very little account, since it is abstract and purely logical. In fact, the philosophy attributed by Dr. Cassirer to Leibniz is a fairy-tale quite as fantastic and arbi-

trary as the *Monadology* used to seem to be, whereas the system set forth by M. Couturat consists of deductions, drawn in Leibniz's own words, and almost all of them valid, from logical principles which in his day were universally admitted.

After a discussion of the origin of Leibniz's philosophy, there is a critical appendix in which the author's views are defended against M. Couturat and myself. It is urged (p. 537) that Leibniz's theory of phenomena presupposes a system of fundamental relations not reducible to predications. The reply is, that it is just because of this irreducibility that the said phenomena are regarded by Leibniz as phenomena and not as noumena.

The work is thorough and careful in its use of the sources, though there is, to my mind, a somewhat undue amount of interpretation and a somewhat excessive readiness to regard as figurative expressions which another theory could accept literally. The criticisms which have been made in the above review are almost all of them criticisms of the Kantian philosophy itself, and those who accept that philosophy will find in Dr. Cassirer's book exactly what they desire.

## ON LEIBNIZ'S EXPLICATION OF "NECESSARY TRUTH"

MARGARET D. WILSON

Leibniz's remarks on necessity are dominated by two primary themes. The first, of course, is the thesis that a necessary truth may be defined as a proposition which possesses, "implicitly" if not "expressly," a specific logical form. (This is sometimes referred to, in recent works, as the thesis that necessary truths are "analytic.") The second is Leibniz's frequently reiterated contention that while the word "necessary" has application both to voluntary action and in connection with explanations of why the world is as it is, "necessary" as used in these contexts is not equatable with "logically necessary." It is with respect to these contexts that Leibniz speaks of "moral necessity" and "physical necessity," claiming that a distinction must be recognized between different "degrees" or different "species" of necessity.<sup>1</sup>

From *Akten des Internationalen Leibniz-Kongresses*. Hanover, 14-19 November 1966, Band III (Franz Steiner Verlag: Wiesbaden, 1969). Reprinted by permission of the author and the publisher.

<sup>1</sup> Cf. *Théodicée*, *Préface* (GP VI, pp. 33, 64).—The following abbreviations are used below: GP = Leibniz, *Die philosophischen Schriften*. Hrsg. C. I. Gerhardt. Bd 1-7. Berlin 1875-90.—N. E. = *Nouveaux essais sur l'entendement humain*. (= Gottfried Wilhelm Leibniz, *Sämtliche Schriften und Briefe*. Hrsg. v. d. Deutschen Akademie der Wissenschaften. R. VI, Bd VI. Berlin 1962.)—C = Leibniz, *Opusculs et fragments inédits*. Ed. Louis Couturat. Paris 1903.

These two theses can appear incompatible if it is assumed that when Leibniz *defines* a necessary truth as a proposition which possesses a specific logical form he is providing an analysis of his understanding of the meaning of the word "necessary." For if "necessary" simply *means* "analytic," then there cannot be truths which possess a degree of necessity but are not analytic; and there manifestly cannot be different degrees of analyticity.

In the first part of this paper I shall examine the status of Leibniz's unvarying definition of "necessary truth." I shall argue that there are reasonable grounds, independent of his talk of moral and physical necessity, for regarding this definition as something *other* than a purported analysis of the meaning of "necessity." I shall also try to illuminate the important role this definition plays in Leibniz's thought, and very briefly indicate some contrasts with related views on necessary and analytic truth held by Leibniz's predecessors and by more recent philosophers. I shall then briefly consider the question whether the notions of moral and physical necessity, as Leibniz explains them, can in fact be regarded as fundamentally distinct from the notion of logical necessity. (For reasons of space I shall have to ignore here the relevant but involved question of the significance of Leibniz's well-known dictum that for God all truth is somehow conceptual or analytic.) In conclusion I shall make some remarks about Leibniz's handling of a class of truths which seem to have strong claims to "necessity," but which do not seem to fall under the species of necessity that he explicitly recognizes.

## I

Leibniz's definition of necessary truth is one of the best known tenets of his philosophy:

A necessary proposition is one the opposite of which is not possible, or the opposite of which hav-

ing been assumed, a contradiction is arrived at by resolution.<sup>2</sup>

It is frequently remarked that this definition is "traditional," and it is of course true that the explication of necessary truth in terms of the contradictoriness of the opposite has many antecedents in the writings of scholastic philosophers. Leibniz's definition has, however, special significance because of his strict understanding of the key term "self-contradictory," and must therefore be distinguished from certain previous (as well as later) accounts which superficially resemble his. For philosophers as diverse as Thomas Aquinas and Descartes a self-contradictory assertion is simply a judgment which joins together "mutually opposing" ideas. (*Repugnare*, *opponere*, and *adversari* are among the verbs used to express this notion.)<sup>3</sup> The recognition of "opposition" among ideas is itself left to intuition stimulated perhaps by a few examples: e.g., "A man is an ass." This position is in fact quite different from that of Leibniz, for whom a self-contradictory proposition is one which *formally en-*

<sup>2</sup> C 374. Translations in this paper are my own unless otherwise indicated.

<sup>3</sup> Cf. e.g., Thomas de Aquino, *Summa theologiae*, I, q. 25, a. 3; Descartes, *Oeuvres*. Ed. Ch. Adam and P. Tannery. T. 1-11. Paris 1897-1908. T. VII, p. 152. A similar intuitive, non-formal notion of self-contradiction seems to be present in the writings of various recent philosophers. For instance Alfred Jules Ayer in his *Language, Truth, and Logic*. 2d ed. rev. New York, 1957, maintains that the propositions of logic and mathematics are necessary in that we cannot abandon them "without contradicting ourselves, without sinning against the rules which govern the use of language, and so making our utterances self-stultifying" (p. 77). He also asserts (p. 95) that "the one thing we may not do" is maintain a set of hypotheses which are "incompatible" or mutually self-contradictory. At the same time he vigorously denies (p. 81) that any a priori truth, including the principle of non-contradiction, is prior to others or the grounds of their validity. Thus, while necessity is explained with reference to the notion of self-contradiction, this is evidently not the same for Ayer as grounding necessary truth in the *principle of non-contradiction*.

tails a denial of (his version of) the principle of non-contradiction: i.e., a proposition which is either expressly of the form "A is not-A" or "AB is not-A," or can be reduced to a proposition of one of these forms by a series of substitutions of definientia for definienda. (It may be noted that the scholastic chestnut just cited is on this view at best *implicitly* self-contradictory: its contradictoriness remains to be proved through a reduction to the standard form.)

That the opposite or denial of a necessary truth must be self-contradictory in this sense has an important consequence for the form of the necessary truth itself, enabling Leibniz to present a more direct and simple definition of necessity: a necessary truth is an express or implicit "identity," i.e., a proposition which is either expressly or implicitly of the form "A is A," or "AB is A," or may be reduced to one of these forms by the substitution of definitions.<sup>4</sup> Since the principle of identity is treated by Leibniz as merely a part of the complete formulation of the principle of non-contradiction,<sup>5</sup> we may continue to say that necessary truths are founded in or are true by the principle of non-contradiction. Leibniz classes as "contingent" those truths which are not reducible to "identities."

But, we may now ask, precisely what relationship does Leibniz wish to claim between the terms "necessary"—"impossible" on the one hand, and "reducible to identity"—"reducible to contradiction" on the other hand? As I have already noted, it seems natural to assume that the latter pair of expressions are intended as analyses of the meaning of the former terms. If this is Leibniz's position, however, there is an obvious and important objection to it. Adapting G. E. Moore's "open question" argument, we may ask: is it not perfectly intelligible to inquire whether

<sup>4</sup> C 371.

<sup>5</sup> Cf. e.g., GP VII, 299.

the principle of non-contradiction is itself *necessary*?<sup>6</sup> What this question points up, I think, is that Leibniz's definition, as stated, omits or abstracts from the connotations of inevitability or indispensability normally associated with the word "necessary." To say that a proposition is (implicitly or expressly) identical does not seem to be at all the same as to say that it *has to be true*. Thus, whether having the form of an identity makes a proposition necessary is a meaningful or "open" question, as the word "necessary" is ordinarily used. As Bertrand Russell remarks, à propos of Leibniz's definition, "Necessity must mean something other than connection with the Law of Contradiction," since "the statement that analytic propositions are necessary is significant." Russell concludes that "it would seem that necessity is ultimate and indefinable."<sup>7</sup>

This line of argument makes it seem desirable to try to find an alternative interpretation of Leibniz's position. It might be suggested that Leibniz intends by his definition to provide, not an analysis of the meaning of "necessary," but only a criterion or mark by which necessary truths are to be distinguished from others. There seems, indeed, to be evidence for the truth of this suggestion in Leibniz's own writings. Consider, for example, the following passages:

Whatever implies a contradiction is impossible, for this is to say nothing.<sup>8</sup>

How can faith decree anything, which overthrows a principle without which all creation and affirmation or negation would be vain? It must therefore neces-

<sup>6</sup> Cf. George Edward Moore, *Principia Ethica*, Cambridge, England, 1959, pp. 15-16, 21. (The 1st ed. of this work appeared in 1903.)

<sup>7</sup> Bertrand Russell, *A Critical Exposition of the Philosophy of Leibniz*, 2d ed. London 1937, p. 23. (The 1st ed. appeared in 1900.)

<sup>8</sup> From Leibniz's notes on Boyle's *Some Considerations about the Reconcilableness of Reason and Religion*, quoted (in translation) by Leroy Earl Loemker in his article, *Boyle and Leibniz*, In: *Journal of the History of Ideas*, XVI (1955), p. 38.

sarily be the case [il faut donc necessairement] that two propositions which are true at the same time are not complete contradictories.<sup>9</sup>

Thus the principle of contradiction is the principle of all truths of reason, and if it is given up [sublato] all reasoning is given up [tollitur]. . . .<sup>10</sup>

The first two of these passages seem sufficient to indicate that Leibniz was not, in the last analysis, inclined to hold that "reducible to identity" is the full meaning of "necessary," nor "reducible to contradiction" of "impossible." For both passages suggest that one can give a reason *why* what is reducible to identity or contradiction is (respectively) necessary or impossible: "whatever implies a contradiction is impossible, *for* this is to say nothing"; "it must *therefore necessarily* be the case [that two true propositions are not contradictories]." But if "necessary" meant "reducible to identity" (or "impossible," ". . . contradiction"), it would be as absurd to advance reasons why the identical is necessary or the contradictory impossible as to advance reasons why all bachelors are unmarried men. The three passages taken together make it clear that Leibniz is prepared to claim that the principle of non-contradiction is "necessary" on the grounds that it is in some sense an indispensable condition of reasoning or knowledge itself. His position, apparently, is one that goes back to Aristotle: if there is to be meaningful discourse (reasoning), the affirmation of any statement must be taken to exclude the denial.<sup>11</sup>

I do not propose to consider the question whether Leibniz is right in holding the principle of non-contradiction is epistemologically indispensable in this sense, but let us assume for a moment that he is. It might be thought that the "necessity" thus established for the principle could be only a relative necessity—relative, that is, to the conducting of a certain practice, the practice of reasoning. In the

<sup>9</sup> N. E. IV, xviii, § 1.

<sup>10</sup> GP IV, 237.

<sup>11</sup> Cf. Aristotle, *Metaphysics*. iv, 3. 1006a.



same way, it seems, acceptance of the statement "God exists" might be necessary for the practice of worship; however, it is not necessary that we accept this statement, since it is not necessary that we worship. But Leibniz himself expressly indicates in the *Nouveaux essais* that he would not regard this analogy as valid:

One must distinguish between what is necessary to support our knowledge, and what serves as the foundation of our received doctrines or our practices.<sup>12</sup>

While Leibniz's elaboration of this distinction *in loco* is not very illuminating, the following consideration is perhaps sufficient to suggest that there actually is an important difference between the two cases. An *epistemologically* indispensable truth, as the necessary condition of meaningful affirmation and denial, could not itself be meaningfully denied. In other words, any principle which is a necessary condition of reasoning itself, cannot intelligibly be challenged, since any challenge of the truth of a principle must take place *within the framework* of rational discourse. I think, therefore, that Leibniz may be right in indicating that his argument for the "necessity" of the principle of non-contradiction is more conclusive and less crudely pragmatic than would be the superficially analogous argument for the "necessity" of the proposition "God exists."

Since Leibniz does argue for the "necessity" of the principle of non-contradiction, then, it might seem that "reducibility to identity" should be regarded simply as a characteristic which adequately distinguishes necessary or indispensable truths from others (without standing as an analysis of the meaning of "necessity"). But this interpretation of his definition is not satisfactory either. For in one passage Leibniz expressly indicates that the principle of non-contradiction shares what I have called epistemological indispensability with a *contingent* truth, *quod*

<sup>12</sup> N. E. IV, xvii, § 19.

*varia a me percipiuntur*.<sup>13</sup> (But if *quod varia a me percipiuntur* is epistemologically indispensable, "I exist" should have the same status for Leibniz, since he normally cites this truth too as a "first truth of fact or of experience."<sup>14</sup>) Leibniz's distinction between necessary and contingent truths therefore does not seem to correspond to the distinction between propositions which are epistemologically indispensable and those which are not. But if the definition of necessary truth is neither to be understood as an analysis of the meaning of "necessary," nor as a criterion by which indispensable truths are distinguished from others, how are we to understand it?

I think we must conclude that the sense of "necessary truth" which Leibniz attempts to establish with his definition is a complex and quite strong sense. It is neither independent of considerations of indispensability nor entirely a function of them. For a truth to be necessary in this strict sense it must possess the logical form of an identity, and not all epistemologically indispensable truths do possess this form. Thus Leibniz's definition links up with traditional views of necessity through the notion of the "contradictoriness of the opposite." It also conforms to the traditional tenet that only "eternal" truths may strictly be treated as "necessary"; the principle of non-contradiction, unlike the first truth or truths of experience, can be stated without reference to temporal beings. On the other hand, while all and only non-contingent truths possess the form of identity, their *being necessary* is not merely a matter of their possessing this form. "Necessary truth" is at no point reduced by Leibniz to a bare

<sup>13</sup> Cf. esp. C 183: "*Duo illa prima principia: unum rationis: Identica sunt vera, et contradictionem implicantia sunt falsa, alterum experientiae: quod varia a me percipiuntur* talia sunt, ut de iis demonstrari possit, primo demonstrationem eorum impossibilem esse; secundo omnes alias propositiones ab ipsis pendere, sive si haec duo principia non sunt vera, nullam omnino veritatem et cognitionem locum habere. Itaque aut admittenda sunt sine difficultate, aut omni inquisitioni veritatis renuntiandum est."

<sup>14</sup> Cf. N. E. IV, vii, § 7, ix; §§ 3-4.

formal concept, shorn of all connotations of inevitability or indispensability. For these connotations are retained, in the case of logical necessity, by taking into account (or assuming) the epistemological indispensability of the principle of identity itself.

My purpose in examining the notion of epistemological indispensability has been to show that Leibniz's definition of "necessary truth" in terms of identity, far from providing a complete analysis of his understanding of the meaning of "necessary," serves to establish a strict and technical sense of "necessary truth" which is itself partly parasitical upon a broader, nonformal, and perhaps indefinable concept of necessity. This broader concept may, of course, be understood as roughly equivalent to that of indispensability or of inevitability in general. The qualification "epistemological" merely indicates one sort of grounds on which this necessity may be claimed.

Following Leibniz's own usage, we may, when there is danger of ambiguity, refer to his technical sense of "necessary truth" with the expression "logical necessity."<sup>15</sup> To say that a truth is contingent is to say that it is not *logically* necessary. It does not follow, as we have already seen, that the word "necessary" can have no significant application within the domain of contingent truths. I shall return to this point in a moment. First, however, we must consider one further aspect of the definition of logical necessity.

Leibniz's insistence on the definition of necessary truth by reference to a certain logical form is of course bound up with his methodological position that in scientific thought objective criteria of truth are infinitely to be preferred over "intuition" or psychological incapacity to doubt. He maintains, in particular, that even apparently

<sup>15</sup> Cf. e.g., Leibniz's fifth paper in correspondence with Clarke, § 4. Leibniz also uses the terms "absolute necessity," "metaphysical necessity," "geometrical necessity," and "mathematical necessity" as synonymous with "logical necessity."

obvious mathematical and logical propositions must be "proved." The "proof" will consist, precisely, in showing that these propositions are identities.<sup>16</sup> Now the thesis that all of mathematics and logic can in fact be established with formal rigour through employment of definitions and identical axioms alone is an extremely bold and significant one. It is therefore of considerable interest that Leibniz, who throughout his life maintained this thesis with the most absolute conviction, never produced more than meagre substantiation for it. It is true, as Kauppi remarks,<sup>17</sup> that Leibniz "illustrates" his thesis by offering a few sample reductions: e.g., of " $2 + 2 = 4$ ,"<sup>18</sup> "equals added to equals yield equals,"<sup>19</sup> and the principle of the syllogism.<sup>20</sup> But these efforts are fragmentary and unsystematic: there is certainly a world of difference between "illustrating" a thesis and establishing it. It is also true that Leibniz expended much effort on developing logical calculi that would make possible the demonstration of logical and mathematical truths. But among the primitives of these calculi one finds not only definitions and identical axioms (in Leibniz's sense of "identical"), but also such non-identical axioms as the principles of permutation and of tautology.<sup>21</sup> Kauppi suggests that the latter principles should be regarded as "hypothetical" axioms—admitted only provisionally until a method of eliminating them might be devised.<sup>22</sup> But one may still wonder why Leibniz persisted in holding so firmly that it is

<sup>16</sup> Cf. N. E. I, i, § 5; IV, vii, §§ 1, 8; GP VI, 503-4; GP VII, 296.

<sup>17</sup> Raili Kauppi, *Über die Leibnizsche Logik*. Helsinki 1960. (= *Acta Philosophica Fennica*. Fasc. XII), p. 125.

<sup>18</sup> N. E. IV, vii, § 10.

<sup>19</sup> GP III, 258-59.

<sup>20</sup> C 229-30.

<sup>21</sup> See GP VII, 224-47; C 235. Cf. Kauppi, *op. cit.*, p. 160; also, Louis Couturat: *La logique de Leibniz*, Paris 1901, pp. 321, 337, 346, 365.

<sup>22</sup> Kauppi, *op. cit.*, p. 127.

both important and possible ultimately to eliminate all non-identical "axioms." And I think that at least part of the answer to this question must be found in the intimate relation—traditionally and in Leibniz's thinking—between the notion of self-contradictoriness and the concept of a necessary (non-contingent) truth. The enterprise of reducing mathematical and logical truths to a few simple primitives was always regarded by Leibniz as equivalent to establishing their necessity;<sup>23</sup> and one may speculate that the extraordinary faith that he had in the possibility of carrying out this enterprise was partly grounded in the assumption that since these truths are all "necessary" in the same sense they *must* all be reducible to identities, their opposites to contradiction.

It is, therefore, somewhat ironic that the well-known work of the logistic theorists of this century which establishes the immense fruitfulness of Leibniz's reductionistic notions does so precisely at the expense of his conception of logical necessity. Russell, for instance, emphatically denies that the principle of non-contradiction has any "special pre-eminence" over other logical truths; and in the *Principia Mathematica* the law of contradiction ( $\sim [p. \sim p]$ ) is not even treated as a primitive.<sup>24</sup> (It is no doubt significant in this connection that recent discussions of the status of mathematical and logical truths, in relation to the work of the logistic theorists, have tended to concentrate on the newer and less traditional concept of analyticity, rather than the ancient question of necessity.)<sup>25</sup>

<sup>23</sup> Cf. e.g., N. E. IV, xii, 4.

<sup>24</sup> Bertrand Russell, *Introduction to Mathematical Philosophy*. London 1919, p. 203.

<sup>25</sup> Cf. Gottlob Frege, *Die Grundlagen der Arithmetik*, Breslau 1884, § 3; Bertrand Russell, *Introduction to Mathematical Philosophy*, chap. xviii; Morton White, *Toward Reunion in Philosophy*, Cambridge, Mass., 1956, pp. 129–63; Willard Van Orman Quine, *Two Dogmas of Empiricism*. In his: *From a Logical Point of View*, Cambridge, Mass., 1953.

## II

We may turn now to the contingent truths. These Leibniz customarily divides into two classes: truths about the choices of rational beings ("I am going on a journey"), and truths which assert or describe states of affairs in the physical world ("The sun is shining in the Western Hemisphere"). He wishes to hold that while neither of these two sorts of truths are logically or "absolutely" necessary, they are, respectively, "morally" and "physically" necessary.<sup>26</sup> Leibniz apparently regards these truths as having some claim to "necessity" because he believes that none of them (or, on another level, none of the choices or events, etc. which they assert to occur) is arbitrary or "undetermined": every truth (choice, event) has its determining "reasons."<sup>27</sup> For any event *e* that occurs, it can be said that *e* "had" to occur, on the grounds that sufficient reason for *e*'s occurrence existed at the time *e* occurred. What we must ask is whether there are grounds for claiming that there is a fundamentally different, non-logical species of necessity involved here.

With respect to physical necessity, the determining conditions for an event are to be sought principally in the hierarchy of increasingly general "laws of nature," together (presumably) with earlier conditions from which *e* follows in accordance with these laws.<sup>28</sup> (This is a somewhat over-simplified account, but good enough for

<sup>26</sup> Cf. Leibniz's 5th letter to Clarke, §§ 4-7, 76; *Discours de métaphysique*, xiii; N. E. II, xxi, §§ 8-9; *Théodicée, Discours de la conformité de la foi avec la raison*, § 2. In some of these passages Leibniz speaks of "hypothetical necessity" rather than "physical necessity." (There are in fact some subtleties and strange variations in his use of these two expressions which I here disregard.)

<sup>27</sup> See for instance, 5th letter to Clarke, §§ 9, 18-19; *Discours de métaphysique*, xiii.

<sup>28</sup> *Ibid.*, vii; C 19-20.

our purposes.) Leibniz believes that while the world is infinitely complex there are a few first or most general laws of nature, which are directly decreed by God.<sup>29</sup> He seems inclined to hold that given the full set of God's initial decrees as premisses, the events in the physical world can be deduced with logical rigour.<sup>30</sup> (It is in this way that natural laws provide the "reasons for" an event.) If this is so, the notion of logical necessity is involved in the definition of physical necessity: an event is physically necessary if a proposition affirming the occurrence of the event follows logically from true premisses which include statements of the natural laws initially decreed by God. In order to determine whether physical necessity is anything but a special case of logical necessity, we must consider the status of the "premisses"—God's decrees.

These Leibniz emphatically maintains to be contingent: God could have created a world governed by other primary laws.<sup>31</sup> On the other hand, the first decrees are themselves "determined": God had *reasons* for decreeing these laws rather than other possible laws.<sup>32</sup> Thus as Leibniz himself remarks, physical necessity is "grounded in" moral necessity, or the necessity governing choice.<sup>33</sup> That he regards moral necessity as quite distinct from logical necessity seems to be indicated by his frequent contention that the reasons which determine choice "incline without necessitating"<sup>34</sup>—i.e., without yielding logical necessity. Leibniz seems to want to claim that in some sense the chooser "cannot" choose otherwise than he does (hence the expression "moral *necessity*"), and yet that there is no logical contradiction in denying that he makes the choice he does make.

<sup>29</sup> *Théodicée*, loc. cit.; C 18–29.

<sup>30</sup> *Ibid.* Cf. GP II, 40.

<sup>31</sup> *Discours de métaphysique*, xiii; *Théodicée*, loc. cit.

<sup>32</sup> *Ibid.*

<sup>33</sup> *Ibid.*

<sup>34</sup> See 5th letter to Clarke, § 9; *Théodicée*, *Remarques sur le livre de M. King*, § 14; C 405.

While the complex question of moral necessity cannot exhaustively be dealt with here, we may consider the three most obvious interpretations of Leibniz's position, in order to see what kind of case can be made for a radical distinction between moral and logical necessity. We shall use God's decision to create *this* world as an example.

A. O. Lovejoy, one of the most perceptive American commentators on Leibniz, has asserted that the purported distinction between "inclining" and "necessitating" reasons is "manifestly without logical substance," and that "the fact is so apparent that it is impossible to believe that a thinker of [Leibniz's] powers can have been altogether unaware of it himself."<sup>35</sup> Lovejoy follows up this remark with an interpretation of "moral necessity" according to which this notion, while not strictly identical with logical necessity, may be defined in terms of it. According to Lovejoy, the only position to which Leibniz is entitled is that other worlds besides this one are possible *considered in themselves*, apart from God's choice, but it is not logically possible *that God should create* one of these other worlds. This reading is unavoidable, according to Lovejoy, because both of the following propositions are treated by Leibniz as logically necessary: (1) "God creates the best world," and (2) "This world is the best world."<sup>36</sup> On this view, that our world is the best world is the reason which determines God to create it, but the relation between the reason and the choice is, precisely, one of logical necessity. A "morally necessary truth" turns out to be a truth the denial of which is not "in itself" self-contradictory, but gives rise to a contradiction when considered in connection with logically necessary truths about the ground of existence, namely God. (This formula would, of course, have to be modified to provide for the applicability of the concept of moral necessity to the results of human choice.)

<sup>35</sup> Arthur Oncken Lovejoy, *The Great Chain of Being*, Cambridge, Mass., 1957, p. 172.

<sup>36</sup> *Ibid.*, p. 173.



While there is much to support Lovejoy's position, it is by no means entirely clear that Leibniz is committed to holding as logically necessary the proposition that God creates the best world.<sup>37</sup> We may therefore consider some alternative readings.

In contending that the world, or God's choice of the world, is only morally necessary, Leibniz might mean that God's creation of this world is a logical consequence of certain prior conditions, but these conditions themselves are *not* logically necessary. He indeed seems to lean in this direction when he announces that it was God's first decree always to do what is best.<sup>38</sup> This decree having once been made His creation of this world might be deducible with logical necessity, but the decree is itself contingent.

But this view of the matter does not take us very far towards establishing a distinction between moral and logical necessity. The contingency of the world is traced to the contingency of the first decree, but the manner in which *this decree* was determined has not been elucidated.<sup>39</sup> So far no content has been given to the notion of moral necessity.

In order to give content to this notion, and to preserve its distinctness from logical necessity, it seems requisite to take seriously the distinction which Lovejoy finds nugatory—the distinction between an “inclining” and a “necessitating” reason. Leibniz must be taken to hold that the truths God would present as reasons for His choice, whether themselves logically necessary or merely contingent, do not logically entail that He made that choice. The question is whether any sense can be made of this idea. Does it make any sense to assert both that a decision D was determined or “necessitated” by conditions C, and that the conjunction, “C and not-D,” does not imply contradiction?

<sup>37</sup> See Nicholas Rescher, *Contingence in the Philosophy of Leibniz*. In: *Philosophical Review*, LXI (1952), and below, n. 38.

<sup>38</sup> *Discours de métaphysique*, xiii.

<sup>39</sup> Cf. Russell, *Philosophy of Leibniz*, p. 39n.

It is certainly true that in many cases the "reasons" that we give for an action or decision do not logically entail the occurrence of that action or that decision. I might say that the reason I went to the ballgame rather than stay home is that I wanted some fresh air. While this would normally be considered a satisfactory statement of what determined my decision, no one would assert that my "wanting some fresh air" logically entailed that I went to the ballgame. For one thing, there should be other ways to get some fresh air; also, even if this were not true, I might "want some fresh air" yet not go to the ballgame—if, for instance, I considered some other goal (such as finishing a letter) more important.

It might be replied, however, that a reason for an action or decision "determines" one to perform that action or make that decision only under the conditions that (a) no other possible action or decision could fulfill the end stated in the "reason," and (b) there are no conflicting ends to which one attaches equal or greater importance which would provide reasons for a different and incompatible action or decision.<sup>40</sup> These further conditions are *understood* to obtain when the "determining reason" is stated, and together with it do logically entail that the given choice is made.

However, I think it might be open to Leibniz to repudiate this objection in one of the following ways. He might argue either (1) that a choice is correctly said to be determined by the reason for which it is made, and not by the lack of reasons for some other choice; or (2) that it is not in fact the case that the conjunction of relevant reasons for and against making a particular decision normally does *logically entail* that the decision which is in fact made *is* made.

When the issue is stated in this way, it does not seem to

<sup>40</sup> In the case of action, we must add the condition that the action is not physically impossible for the agent to perform: in the case of decision, that the end desired is not known by the agent to be unobtainable (or falsely believed to be unobtainable).

me self-evident that Leibniz is wrong and his hypothetical opponent right about the logical relation between reasons and decisions or choices. Neither would I claim that the position here attributed to Leibniz is self-evidently correct. I wish only to suggest that the notion that a choice may be "determined" by reasons without being logically necessitated is *not* "manifestly without logical substance." Despite what Lovejoy says, it is not patently incoherent to speak of determination or "moral necessity" as obtaining where logical necessity does not obtain—at least when the latter notion is given the strict significance that Leibniz in fact accords it. However, I think it must be conceded that the distinction between "inclining" and "necessitating" reasons requires a much fuller explication and vindication than Leibniz ever provides.

### III

In conclusion I would like to say a few words about Leibniz's handling of a group of truths, the existence of which has frequently been urged as a decisive objection to an "analytic" definition of necessary truth. This group includes propositions which assert the *difference* of two "ideas," e.g., "white is not red," "yellowness is not sweetness"; and propositions which assert that one attribute either *excludes* another (e.g., "what is white is not black") or necessarily coexists with another (e.g., "what is coloured is extended").<sup>41</sup> These propositions (which are sometimes characterized as "synthetic a priori") seem to be necessary, and they appear at the same time to be com-

<sup>41</sup> See, for instance, Arthur Pap, *Are all Necessary Truths Analytic?* In: *Philosophical Review*, LVIII (1949), where the incompatibles are discussed with some reference to Leibniz's doctrine; also Hao Wang, *Notes on the Analytic-Synthetic Distinction*. In: *Theoria*, XXI (1955); and B. Russell, *Philosophy of Leibniz*, pp. 20–21.

pletely irreducible to *any* general axiom—including the principle of identity.

It is seldom noticed that in the *Nouveaux essais* Leibniz himself briefly discusses such truths—especially the assertions of the *difference* of two ideas, which he calls “disparates.” At no point does he seem to dispute the “necessity” of any of these truths; indeed, he surely does regard them as necessary. How to handle them within his system is, however, clearly a difficult question for him. In Book I of the *Nouveaux essais* he first says that the disparates are “identities or almost identities,” and adds that “the identities or immediates do not receive proof.”<sup>42</sup> He does not explain how a proposition can be “almost an identity,” but merely offers the highly puzzling “clarification” that these truths involve the application of the “general maxim to particular cases.”<sup>43</sup> A little later he seems rather to lean towards the view that the disparates are not primitives, but *are* subject to proof—i.e., to reduction to formal identities.<sup>44</sup> He does not give any indication of how this is to be done. Still another position is adopted in Book IV, where Leibniz classes the disparates as necessary truths and “negative identities,” and says that they are primitive, but explicitly contrasts them with the primitive truths which are “contradictories”:

I come now to the negative identities which are either true by the principle of contradiction, or the disparates [*qui sont ou du principe de contradiction, ou des disparates*].<sup>45</sup>

He gives some standard examples of primitive truths which are true by virtue of the principle of contradiction (“An equilateral rectangle cannot be a non-rectangle,” etc.) and then proceeds:

<sup>42</sup> N. E. I, i, § 18.

<sup>43</sup> *Ibid.*

<sup>44</sup> *Ibid.*

<sup>45</sup> N. E. IV, ii, § 1.

As for the disparates, these are those propositions which say that the object of one idea is not the object of another idea; e.g., that heat is not the same thing as colour, or man and animal are not the same, although every man may be an animal.<sup>46</sup>

These, he says, "can be assured independently of any proof or of the reduction to opposition or to the principle of contradiction. . . ." Although Leibniz does not here explicitly concede that the disparates *cannot* be reduced to identity, but says only that they do not *need* proof, he clearly implies that they are not instances of the principle of non-contradiction. For he contrasts them with truths that *are* instances, and characterizes them as primitives.<sup>47</sup>

At this point one must conclude that Leibniz's "definition" of necessary truth is virtually condemned out of his own mouth by the admission of primitive necessary truths which are not formal identities, unless one can say that the disparates, while "necessary," are not logically necessary. Our previous observations would seem to suggest that the latter move is open to Leibniz. But there is a difficulty. Leibniz holds that all truths which are not *logically* necessary are dependent on the will of God.<sup>48</sup> Can the difference between heat and colour be any more dependent upon the will of God than the sum of three and two?

<sup>46</sup> *Ibid.*

<sup>47</sup> For allusions to necessary coexistence and exclusion see *N. E.* IV, vi, § 10.

<sup>48</sup> Cf. *Monadologie*, § 46; *Discours de métaphysique*, xiii; Leibniz, *Nouvelles lettres et opuscules inédits*. Ed. Alexandre Foucher de Careil, Paris 1857, p. 179.

## BIBLIOGRAPHY

### *Original texts*

The German Academy of Sciences (East Berlin) began in 1954 to publish a definitive edition of Leibniz's writings. In addition to the volumes of this edition that have already appeared, there are several other valuable collections of original texts:

L. Couturat, ed., *G. W. Leibniz: Opuscles et fragments inédits* (Paris, 1903).

C. I. Gerhardt, ed., *Philosophische Schriften von G. W. Leibniz*, 7 vols. (Berlin, 1875-90).

G. Grua, ed., *G. W. Leibniz, Textes inédits* (Paris, 1948).

Prussian Academy of Sciences, *G. W. Leibniz: Sämtliche Schriften und Briefe* (Berlin, 1924- ).

### *English translations*

*Discourse on Metaphysics*, trans. by P. G. Lucas and L. Grint (Manchester, 1953).

*Leibniz-Arnauld Correspondence*, trans. by H. T. Mason (Manchester, 1967).

*Leibniz-Clarke Correspondence*, ed. by H. G. Alexander (Manchester, 1956).

*Logical Papers*, trans. by G. H. R. Parkinson (Oxford, 1966).

*Monadology and Other Philosophical Essays*, trans. by Paul and Anne Martin Schrecker (New York, 1965).

*New Essays Concerning Human Understanding*, trans. by A. G. Langley (Chicago, 1916).

- Philosophical Papers and Letters*, 2 vols., trans. by L. E. Loemker (Chicago, 1956).  
*Theodicy*, trans. by E. M. Huggard (London, 1951).

### *Bibliographical studies*

- L. E. Loemker, "Leibniz in our Time," *Philosophische Rundschau* 13 (1965-66).  
 K. Muller, *Leibniz Bibliographie* (Frankfurt-am-Main, 1966).  
 Rulon Wells, "Leibniz Today," *Review of Metaphysics* X (1965-67).

### *Books and articles in English about Leibniz*

- Hans Aarsleff, "Leibniz on Locke on Language," *American Philosophical Quarterly* 1 (1964), pp. 165-88.  
 J. Agassi, "Leibniz's Place in the History of Physics," *Journal of the History of Ideas* 30 (1969), pp. 331-44.  
 E. J. Aiton, "The Celestial Mechanics of Leibniz," *Annals of Science* 16 (1960), pp. 65-82.  
 —, "The Celestial Mechanics of Leibniz in the Light of Newtonian Criticism," *Annals of Science* 18 (1962), pp. 31-41.  
 —, "The Celestial Mechanics of Leibniz: A New Interpretation," *Annals of Science* 20 (1964), pp. 111-23.  
 Ignacio Angelelli, "On Identity and Interchangeability in Leibniz and Frege," *Notre Dame Journal of Formal Logic* 8 (1967), pp. 94-100.  
 K. E. Ballard, "Leibniz's Theory of Space and Time," *Journal of the History of Ideas* 21 (1960), pp. 49-65.  
 W. H. Barber, *Leibniz in France, from Arnauld to Voltaire: A Study in French Reactions to Leibnizianism 1670-1760* (Oxford, 1955).  
 E. Cassirer, "Newton and Leibniz," *Philosophical Review* LII (1943), pp. 366-91.  
 S. A. Erickson, "Leibniz on Essence, Existence and

- Creation," *Review of Metaphysics* (1965), pp. 467-87.
- A. H. Johnson, "Leibniz's Method and the Basis of His Metaphysics," *Philosophy* 35 (1960), pp. 51-61.
- G. J. Jordan, *The Reunion of the Churches: A Study of G. W. Leibniz and His Great Attempt* (London, 1927).
- H. W. B. Joseph, *Lectures on the Philosophy of Leibniz* (Oxford, 1949).
- Journal of the History of Ideas*, Leibniz Tercentenary Issue. Vol. VII, 4 (October 1946).
- William Kneale, "Leibniz and the Picture Theory of Language," *Revue Internationale de Philosophie* 20 (1966), pp. 204-15.
- A. Koyré and I. B. Cohen, "Newton and the Leibniz-Clarke Correspondence," *Archives Internationales d'histoire des Sciences* (1962), pp. 63-126.
- L. E. Loemker, "Leibniz's Conception of Philosophical Method," *Zeitschrift für Philosophische Forschung* (1966), pp. 507-25.
- , "Leibniz's Doctrine of Ideas," *Philosophical Review* LV (1946), pp. 229-49.
- , "Substance and Process in Leibniz," in *Process and Divinity*, ed. by W. R. Reese and Eugene Freeman (La Salle, Illinois, 1964).
- Loren Lomasky, "Leibniz and the Modal Argument for God's Existence," *Monist* 54 (1970).
- Edward A. Manier, "Leibniz: First Principles and Systematic Philosophy," *Modern Schoolman* 43 (1965), pp. 39-54.
- , "Matter and Individuation in Leibniz," in *The Concept of Matter*, ed. by E. McMullin (Notre Dame, Ind., 1963), pp. 392-98.
- Gottfried Martin, *Leibniz: Logic and Metaphysics*, trans. by P. G. Lucas and K. J. Northcott (Manchester, 1964).
- W. E. May, "The God of Leibniz," *New Scholasticism* 36 (1962), pp. 506-28.
- Monist* 26, no. 4 (1916): special Leibniz issue, ed. by P. E. B. Jourdain.
- Walter H. O'Briant, "Leibniz's Preference for an In-



- tensional Logic," *Notre Dame Journal of Formal Logic* 8 (1967), pp. 254-56.
- G. H. R. Parkinson, *Logic and Reality in Leibniz's Metaphysics* (Oxford, 1965).
- C. A. van Peursen, *Leibniz*, trans. by H. Hoskins (New York, 1970).
- Richard H. Popkin, "Leibniz and the French Sceptics," *Revue Internationale de Philosophie* (1966), pp. 228-48.
- Nicholas Rescher, *The Philosophy of Leibniz* (Englewood Cliffs, New Jersey, 1967).
- , "Logical Difficulties in Leibniz's Metaphysics," in his *Essays in Philosophical Analysis* (Pittsburgh, 1969).
- B. Russell, *The Philosophy of Leibniz* (London, 1900; second edition, 1937).
- L. J. Russell, "Leibniz's Account of Phenomena," *Proceedings of the Aristotelian Society* LXV (1953), pp. 167-86.
- , "Some Problems in the Philosophy of Leibniz," *Proceedings of the Aristotelian Society* XXII (1923), pp. 199-214.
- , "What Is Living and What Is Dead in the Philosophy of Leibniz," *Filosofia* 19 (1968), pp. 699-712.
- P. Schrecker, "Leibniz and the *Timaeus*," *Review of Metaphysics* (1951).
- Wilfrid Sellars, "Meditations Leibniziennes," *American Philosophical Quarterly* 2 (1965), pp. 105-18.
- Robert C. Taliaferro, *The Concept of Matter in Descartes and Leibniz* (Notre Dame, Ind., 1964).
- A. T. Tymieniecka, *Leibniz's Cosmological Synthesis* (Assen, 1964).
- , "Leibniz's Metaphysics and His Theory of Universal Science," *International Philosophical Quarterly* 3 (1963), pp. 370-91.
- , "Leibniz's Philosophy and Science Today," *Organon* 4 (1967), pp. 157-70.
- A. W. Ward, *Leibniz as a Politician*, Manchester University Lectures, xii (Manchester, 1911).
- P. P. Wiener, "Notes on Leibniz's Conception of Logic

- and its Historical Context," *Philosophical Review* XLVII (1939), pp. 567-86.
- M. D. Wilson, "Leibniz and Locke on First Truths," *Journal of the History of Ideas* 28 (1967), pp. 347-66.
- R. M. Yost, *Leibniz and Philosophical Analysis* (Berkeley, 1954).